THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
July 15, 1991 · Vol. XXV · No. 28 · 92 Pages · $2/Copy · $48/Year

COMPUTERWORLD

Ashton-Tate passes database baton to Borland

Advanced technology joins market clout

ANALYSIS

BY JAMES DALY
CW STAFF

The union of two of the fiercest competitors in the personal computer database market last week has created a technological force that some observers say could be hard to beat.

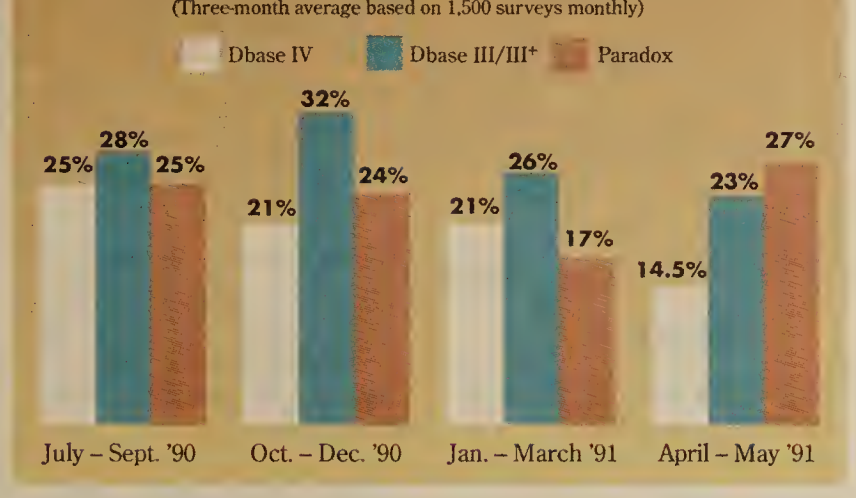
For the past two years, Borland International, Inc. has bet the company's future on object-oriented programming, a visually oriented technique that

Continued on page 8

To the victor go the spoils

Monthly surveys indicate purchases of Dbase are slowing, while Paradox gains greater prominence

Percent of PC DBMS purchases at sites with 500 or more employees
(Three-month average based on 1,500 surveys monthly)



Source: Computer Intelligence

CW Chart: Tom Monahan

Kahn's gambit for top spot clouds Dbase future

BY JAMES DALY
and CAROL HILDEBRAND
CW STAFF

Borland International, Inc. Chairman Philippe Kahn beamed like a kid who just bought the candy store after his acquisition of former database powerhouse Ashton-Tate Corp. last week. But the bold gambit has raised sobering concerns among users and analysts about the fate of core Ashton-Tate products.

Soon after Borland unveiled plans for swallowing its former archrival and locking up the lion's share of the personal computer database market, major questions began to arise about the future of the firms' competing database product lines: Borland's Paradox and Ashton-Tate's Dbase.

While publicly stating that future Dbase IV plans are on track — a Windows version is expected by December — insiders said the Dbase line is ultimately headed for the scrap heap.

That possibility did not sit well with users. "It would be a strategic mistake," said Jack Detrick, director of data processing at Centinela Hospital in Los

Continued on page 8

Developer certification bill sparks battle in New Jersey

BY JOHANNA AMBROSIO
CW STAFF

TRENTON, N.J. — A landmark bill that proposes to license and regulate software developers in New Jersey has stirred up a storm of controversy, with users, vendors and independent consultants alarmed by its ramifications.

Some New Jersey-based vendors have begun banding together to oppose the Software Designers bill, which passed the New Jersey State Assembly on June 27 by a vote of 41 to 32. The bill is now in a state Senate committee pending action when the legislature reconvenes in September.

The bill, which industry observers said is the first of its type in the nation, proposes that "software designers" in New Jersey be licensed and regulated by a newly created State Board of Software Designers. Licenses would be renewable every two years for a fee that has yet to be determined.

State Assemblywoman Barbara F. Kalik, one of the sponsors of the bill, said it is intended to protect consumers from unscrupulous developers. She said that the bill would "not affect" people currently working at user and vendor firms in New Jersey.

However, critics argued that the bill's wording is ambiguous

Continued on page 81

Super Mario strikes stock market gold

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — He is still fighting King Bowser the monster turtle and his Koopalings to save the Mushroom World. But in Japan, the hero of Nintendo Co.'s Super Mario Brothers video game is finding considerable success in an equally high-stakes pursuit: trading stocks.

Since 1987, the mustachioed Super Mario character has been dancing across the screens of Japanese television sets as the system automatically logs users on to a value-added network run by Nomura Securities Co., the top Japanese securities broker. The system is a joint project of Nomura and Nintendo, which makes the phenomenally popular game system marketed as Nintendo in the U.S. and Famicom in Japan.

Nomura teamed up with Japan's largest supplier of home computers to develop the Famicom stock-trading VAN service run by subsidiary Nomura Research Institute Ltd. in Yokohama, Japan. The marriage was ideal because Nomura needed a way to better service its 5.24 million geographically dispersed customers, and Nintendo had a computer system that was used by one in every three households in Japan.

Continued on page 6

IBM calms fears on OS/2 plans

BY PATRICIA KEEFE
CW STAFF

IBM executives brushed aside concerns last week that the company's alliance with Apple Computer, Inc. to develop an object-oriented software environment would sound the death knell for OS/2.

Users who have invested heavily in OS/2 expressed confidence in IBM's intent to migrate them to any future replacement system, although they were at pains to find any obvious benefits in the new strategy.

"There is no dramatic shift" away from OS/2, said Joseph Guglielmi, IBM's vice president and general manager of marketing business development for IBM's Personal Systems Business. OS/2 is the "platform of choice" for Intel Corp.-based technology and will provide a pathway from the Intel base into an object-oriented world, Guglielmi added.

He warned that there were "those in the industry with

Continued on page 78

PC sales growth falls flat

BY MICHAEL FITZGERALD
CW STAFF

Personal computer hardware sales have hit a pothole for the first time since 1985. While most observers said they expect things to improve as the economy does, flat sales could force manufacturers to shake up their strategies and maybe even shake out weaker companies.

Observers attributed the sales decline to the recession, which is causing corporations to delay purchase plans. Other factors cited were users looking for further price cuts, a slowing replacement cycle for older PCs and anticipation of 32-bit operating software.

Projections by market research firm International Data Corp.

Continued on page 79

INSIDE

In Depth — Motorola's IS group strives to be defect-free. Page 59.

Oracle hits $1 billion mark and revises two years of financial reports to clean up its accounting woes. Page 81.

Three little bits gone astray caused recent telephone outages. Page 4.

Quality tool: Black & Decker's IS staff redesigns itself around the total quality philosophy. Page 18.

NEWSPAPER

IN THIS ISSUE

NEWS

4 **NEC** gains a stronger foothold in the European market as it enters a share-swapping agreement with **Groupe Bull.**

6 In the scrap heap: Because of financial problems, **Pan Am**'s $500 million outsourcing plan is history.

10 Hoping to cut down on gridlock, the **Federal Highway Administration** experiments with putting computers in cars.

12 **K Mart** is deciding whether to make a major systems purchase from **Unisys** or **NCR.**

14 Neural networking moves closer to the mainstream as **IBM, Intel** and 30 other companies show off neural network products at an international conference.

79 The recent **IBM/Apple** alliance may offer unexpected help to rival **Microsoft**: Competition among vendors could be stimulated rather than quelled.

80 Advanced laptop and notebook computers may cost more if the **U.S. Department of Commerce** succeeds in slapping Japanese firms with antidumping duties.

81 Get out your scorecards: IS exec **Michael Heschel** has changed jobs again. Now he's the top IS dog at The Kroger Co., the nation's second-largest grocery store chain.

Quotable

"It's a bit perplexing as to why Borland would pay all that much money for something they were going to get for free."

FRANK KING
LOTUS

On Borland's recent gains in the database market.
See story page 1.

SYSTEMS & SOFTWARE

25 Analysts say midrange computer manufacturers are feeling the same pressures that forced PC makers to slash prices.

PCs & WORKSTATIONS

35 Software developers may get the antitrust shield they need with the release of a white paper on network licensing.

38 Technology Analysis: **Microsoft**'s DOS 5.0 receives praise from reviewers, analysts and users who applaud its memory management, utilities and shell interface.

NETWORKING

45 **Symbol Technologies** releases a product aimed at eliminating network cabling.

MANAGER'S JOURNAL

51 One year ago, **Hyatt Hotels** overhauled its computerized reservation system. Today, the firm is glad it made the change.

COMPUTER INDUSTRY

63 Massively parallel processing computers have won scads of fans in scientific circles, but business users say the machines don't offer the kind of power they need.

EXECUTIVE REPORT

55 What's all this noise about **re-engineering?** Is it an overused buzzword or the savior of U.S. competitiveness?

IN DEPTH

59 Six Sigma — **Motorola**'s quality program to reduce defects companywide — has taken hold in IS. By Glenn Rifkin.

DEPARTMENTS

6, 80 News Shorts
19 Advanced Technology
22 Editorial
54 Calendar
65 Computer Careers
66 Managing Your Career
72 Marketplace
77 Stocks
82 Inside Lines

The 5th Wave

EXECUTIVE BRIEFING

■ **Borland International's $439 million acquisition of battered former archrival Ashton-Tate** is raising analysts' eyebrows and users' suspicions that Ashton-Tate's product lines will soon be history. Borland Chairman and CEO Philippe Kahn pledges to keep Paradox and Dbase alive. Industry observers see the buy as an offensive move on tottering software player Oracle's turf. **Page 1.**

■ **Four years into Motorola's five-year defect reduction program known as Six Sigma,** IS has achieved 40% productivity improvement in hardware and network-type functions. In fact, IBM Systems Network Architecture defects have been reduced from 6,000-plus defects per million opportunities to only 10 or 15 defects per million. Instituted corporatewide, Six Sigma has saved Motorola $1.5 billion so far. **Page 59.**

■ **With fewer dollars to spend on salaries,** managers say they'd rather hire experienced workers and get more bang for their buck. **Page 65.**

■ **Spectrum One,** a combination of handheld terminal/scanners, networking software and spread-spectrum radio transceivers just out from Symbol Technologies, is getting a warm welcome from transaction processing users who find the traffic too slow on narrow-band networks. **Page 45.**

■ **Re-engineering is the industry's latest buzzword,** but many more companies are talking more about rethinking business processes than actually re-engineering. **Page 55.**

■ **A Micro Managers Association white paper** due out this fall could propose a software licensing scenario acceptable to both vendors and users — and to antitrust enforcers as well. **Page 35.**

■ **Details of the IBM/Apple alliance** should be out in time for Comdex/Fall '91. Early information hints at plans for a three-tier Power PC vetted by its own new standards group. **Page 79.**

■ **Super Mario Brothers may be about to look more like Salomon Brothers** as video game titan Nintendo — whose teamwork with Japanese stock brokerage Nomura Securities is making home stock trading a blockbuster hit on Japanese television — eyes the U.S. home "infotainment" market. **Page 1.**

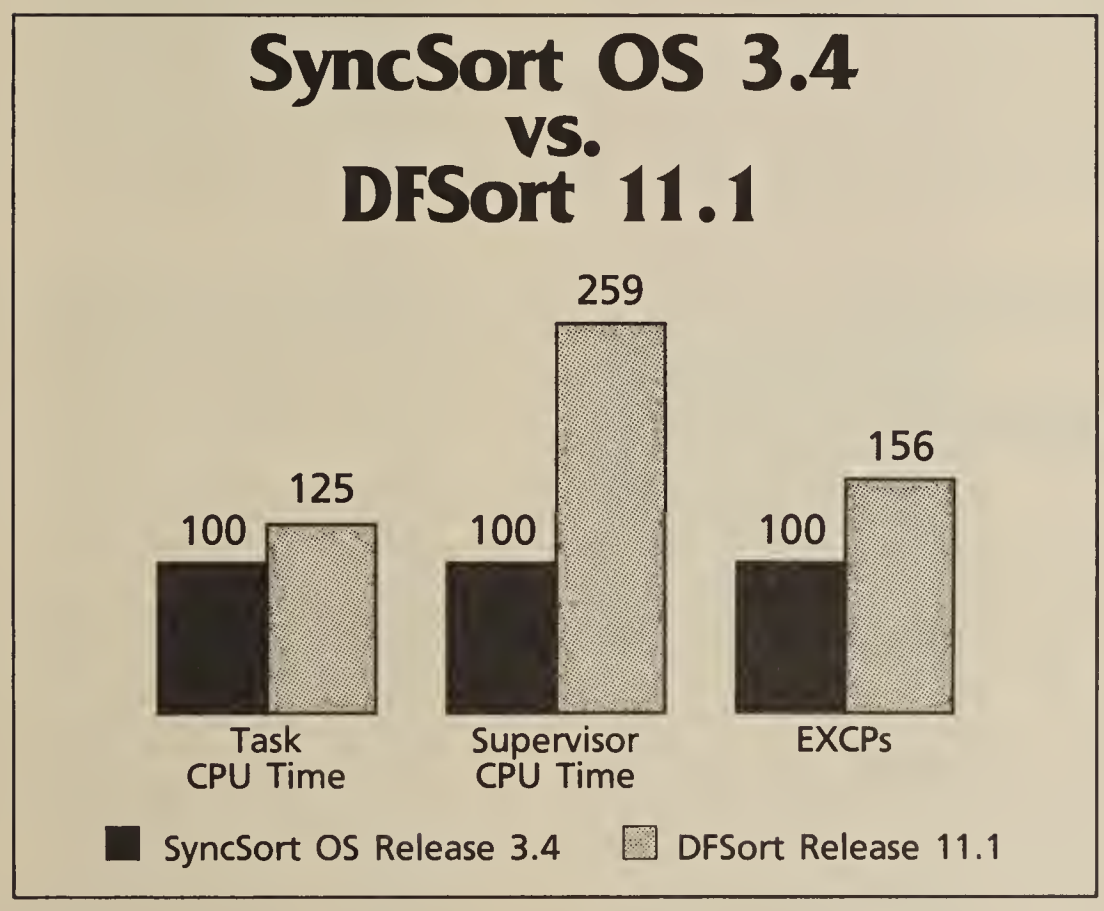
■ **No life left in midrange computing? No way, industry analysts say.** Micro-based technology moving into midrange machines is shrinking the price gap between PCs and servers, just as the gap between midrange and mainframe performance is narrowing. **Page 25.**

■ **Hyatt Hotels is celebrating the first anniversary** of its money-saving move from an IBM mainframe-based reservation system to a Unix-based RDBMS: IS Vice President Gordon Kerr is now senior vice president of IS; assistant VP Dan Amedro is manning Kerr's old post. **Page 51.**

■ **The tenets of Total Quality Management sound like bumper stickers** — so why is a $4.8 billion tool company's IS department sticking with them? Because they work, says Black & Decker IS executive Sidney Diamond. **Page 18.**

■ **On site this week:** Computerized bookies? You bet! At Leroy's Horse and Sports Palace in Las Vegas, owner Vic Salerno tracks the action on a PC-accessed WORM-based optical storage system linked by modem to 18 other betting sites. **Page 40.** Bankers may not be risk takers, but at The Boatmen's National Bank of St. Louis, they're becoming RISC users. The bank credits advances in PC technology and the development of good Unix-based trading applications with the early success of its trading floor's $5 million move into open systems and distributed processing. **Page 40.**

THE BEST KEEPS GETTING BETTER.



Best performance.
Best features.
Best value.
In production ***NOW.***

syncsort INC.
50 Tice Blvd., Woodcliff Lake, NJ 07675
800-535-3355

States file suit against TRW

BY MITCH BETTS
CW STAFF

The credit bureau industry, already under attack by federal officials and consumer advocates, was slapped with lawsuits from six states last week. The states singled out one of the industry's big three players — TRW, Inc. — and charged it with having credit databases riddled with errors and with violating consumer privacy.

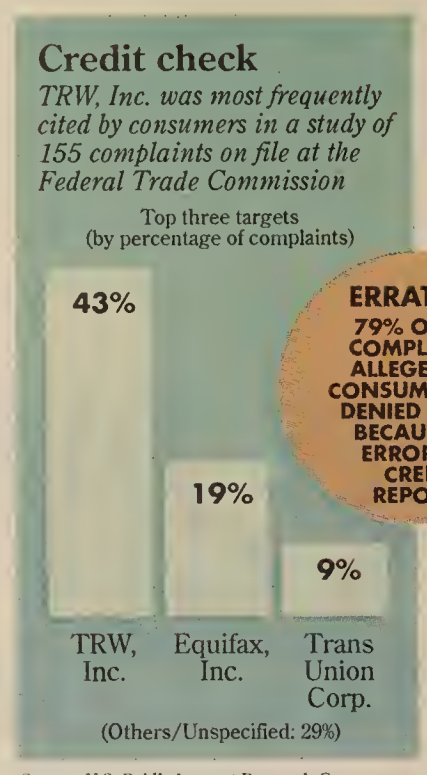
The lawsuits, filed separately by the attorneys general in Texas and New York, were triggered by thousands of consumer complaints about negative but inaccurate information appearing in their credit reports. A common complaint is that credit records of people with similar names get mixed up.

The states alleged that TRW, in violation of state consumer protection laws, has inadequate procedures for preventing and correcting errors and that it illegally sells mailing lists based on credit reports.

"TRW has shown an arbitrary and callous disregard for how its actions have hurt many families" that are denied credit because of the errors, said Texas Attorney General Dan Morales in a statement. The other states participating in the Texas lawsuit are Alabama, California, Idaho and Michigan.

TRW's Information Services Division, based in Orange, Calif., denied the charges and said it goes to great lengths to ensure the accuracy and privacy of its credit reports on 170 million Americans. The company filed countersuits in Texas and New York, seeking rulings that its practices are legal under the federal Fair Credit Reporting Act.

The credit reporting industry has long argued that selling mailing lists of consumers in certain financial categories — to businesses that then use them for highly targeted marketing campaigns — is permissible under federal law. However, consumer advocates disagree.



Source: U.S. Public Interest Research Group

Meanwhile, key members of Congress, with support from the Federal Trade Commission (FTC), are planning to add more consumer safeguards to the 20-year-old Fair Credit Reporting Act. At a congressional hearing last month, the FTC said that complaints about credit bureaus shot up 50% to 9,000 last year, making the bureaus No. 1 on the consumer hit list.

During the hearing, TRW and other officials took a new, conciliatory stance and said they will try to improve accuracy and customer service. But the industry also deflected some of the blame, arguing that the accuracy depends on the data obtained from merchants and consumers.

The industry testified that it is difficult to compile an accurate credit record for consumers who do not use the same version of their name and address on various credit applications.

Associated Credit Bureaus, Inc., the industry's Houston-based trade association, suggested that using Social Security numbers as national identifiers would help keep people's records straight.

Phone outages traced to software updates

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — For the want of three bits, the network was lost.

DSC Communications Corp. said last week that minor software updates in its call-routing switches caused the mysterious disruptions that recently knocked out telephone service to 10 million people in five states and the District of Columbia.

Three binary digits, set incorrectly, failed to trigger algorithms to stem the tide of network management messages that drowned the phone systems. The company acknowledged that the software changes, released in April, had not been rigorously tested.

DSC said it had turned up no evidence of sabotage.

Although the immediate problem was solved by pinpointing the cause of the network failures and distributing software patches to DSC customers, the telephone disruptions have raised a number of technical and policy issues that could remain unresolved for months or years.

Congressmen and witnesses testifying at a hearing on the outages last week directed most of their concerns not at DSC but at the telephone companies, which they said should have better contingency plans for dealing with the disruptions that are certain to occur as network software becomes more complex.

"Our public switched networks are becoming more — not less — vulnerable to disruption because of new technology and certain regulatory trends," John C. McDonald, president of MBX, Inc., told a subcommittee of the U.S. House of Representatives.

Two years ago, McDonald chaired a committee appointed by the National Research Council to study the vulnerability of the public telephone system. In a report that was viewed by many at the time as alarmist, the committee warned that an exponential increase in the complexity of network software, coupled with a trend to concentrate processing in fewer but bigger switches, would create "points of potentially catastrophic failure."

Richard Firestone, chief of the Federal Communications Commission's (FCC) Common Carrier Bureau, agreed — to a point. "Redundancy became a vehicle to spread the problem, so the problem was not a lack of redundancy . . . the notion of backups is vital." Nevertheless, Firestone said that having a duplicate network for backup is probably impractical from a cost point of view.

The federal regulatory apparatus also came under fire. McDonald said the antitrust consent decree that broke up the old Bell System encouraged a dangerous concentration of network traffic at a few points because that was the easiest way local carriers could give long-distance carriers court-mandated "equal access" to the local networks.

That concentration is what made the 1988 fire at an Illinois Bell switching center so disastrous, he said.

NEC gains French stake

BY SALLY CUSACK
CW STAFF

PARIS — NEC Corp. of Japan entered into French territory via a share-swapping agreement with Groupe Bull. The culmination of the long-negotiated contract should provide NEC with a stronger foothold in the European market.

Patrick K. Marx, a spokesman at Bull's Paris headquarters, said terms of the contract dictate that NEC will exchange its 15% interest in U.S.-based Bull HN Information Systems, Inc. for a 4.7% stake in Bull's parent organization, Compagnie des Machines Bull. "This will not directly affect jobs or cause layoffs at Bull HN," Marx said.

User reaction to the changes has been optimistic. Customers in the U.S. said the NEC alliance may strengthen the existing working relationship between the two companies.

Previous Bull employee layoffs "took away from the field office's clerical force," said Wendy S. Bell, assistant manager of information systems for the city of Pittsburgh, a large Bull shop. "It slowed down order processing and other things.

"We have been told this is over, that they have been authorized to hire clerical staff," Bell said. "I know this seems like a small example, but believe me, it makes a big difference."

"It's got to be a change for the better. They certainly weren't going anywhere the way they were," added an IS director who uses a Bull mainframe at a Midwestern manufacturing firm.

CORRECTIONS

A July 8 article implied that Cisco Systems, Inc. will sell and support the router module it co-developed for Synoptics Communications, Inc.'s intelligent wiring hub. Synoptics — not Cisco — will handle the product's sales and support. The quote from The Yankee Group analyst Todd Dagres comparing training and research and development with Cabletron Systems, Inc. referred to Synoptics, not Cisco.

Incorrect contact information for Mustang Software, Inc. was given in a June 24 product announcement. Mustang Software is located at 915 17th St., Bakersfield, Calif. 93303. The telephone number is (805) 395-0223.

The NASA Lewis Research Center should have been identified as the principal nominee for a *Computerworld* Smithsonian Award in the manufacturing category in the June 24 issue.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik
Assistant News Editor
James Connolly
Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, PCs & Workstations
Michael Alexander, Advanced Technology
Rosemary Hamilton, Systems & Software
Nell Margolis, Industry
Maryfran Johnson, Systems & Software
Senior Writers
Joanie M. Wexler
Sally Cusack
Michael Fitzgerald
Staff Writers
Carol Hildebrand
Christopher Lindquist
Kim S. Nash
New Products Writer
Derek Slater
Research Coordinator
Kevin Burden

Features Editor
Joanne Kelleher
Senior Editors
Michael L. Sullivan-Trainor
Joseph Maglitta
Lory Zottola
Mary Grover Brandel
Senior Writer
Alan J. Ryan
Associate Editors
Cathleen A. Duffy
Susan R. Nykamp
Researcher
Jodie Naze
Assistant Researcher
Stefanie McCann
Intern
Lisa Davidson

Chief Copy Editor
Joyce Chutchian
Assistant Chief Copy Editor
Catherine Gagnon
Features Copy Editors
Kimberlee A. Smith
Alice Lesch Kelly
Copy Editors
Kelly E. Dwyer
Steven J. Condon
Catherine Cuddihee
Lisa McFarren

Design Director
Nancy Kowal
Graphics Designer
Tom Monahan
Design Assistant
Marie J. Haines
Graphics Specialist
Janell Genovese

Assistant to the Editor in Chief
Linda Gorgone
Editorial Assistants
Lorraine Witzell
Connie Brown
Aleksandra Skulte
Rights and Permissions Manager
Sharon Bryant
Back Issues
Margaret McIndoe

News Bureaus
Mid-Atlantic
201/967-1350
Johanna Ambrosio, Senior Correspondent
Washington, D.C.
Mitch Betts, National Correspondent
202/347-6718
Gary H. Anthes, Senior Correspondent
202/347-0134
West Coast
415/347-0555
Jean Bozman, Senior West Coast Editor
J.A. Savage, Senior Correspondent
James Daly, Senior Correspondent
Jim Nash, Correspondent
Marilyn Scott, Editorial Assistant
Midwest
708/827-4433
Ellis Booker, Bureau Chief

IDG News Service
Penny Winn, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Fax: 508/875-8931
MCI Mail: COMPUTERWORLD
Subscriptions: 800/669-1002

A recent study of over 4,000 Datamation Magazine subscribers named Oracle Financials as the accounting software they are most likely to buy this year.

Which isn't too surprising, when you consider everything they have to offer.

Datamation® states "Oracle is the only clear winner" in accounting software.

Oracle Financials are the first complete and integrated family of cross-industry accounting software based on modern relational technology. In other words, the modern alternative to the ineffective, unresponsive accounting software built in the 1970's.

Whether you're a growing enterprise or a giant conglomerate, Oracle Financials can be quickly configured to do business the way you want. Then altered or extended as your needs change. All without programming.

Oracle Financials are powerful enough to do large-scale, multi-national, decentralized accounting. So large companies can use them in all their international and domestic divisions, subsidiaries and departments. Which means everybody gets the information they need, when they need it. Even headquarters.

Oracle Financials are the first major accounting software with 1-2-3 and Macintosh-like menus. To give your users unprecedented ease of use.

Like all Oracle products, Oracle Financials run on virtually any computer you have today, or will have tomorrow. On mainframes or low cost minicomputers, workstations and PCs. So you can use the computer or group of computers that makes the most sense for your company and your budget.

But more than just software, Oracle provides the education, consulting and support services to maximize your success with Oracle technology. In fact, over one-third of the 8,000 people at Oracle are devoted to customer service.

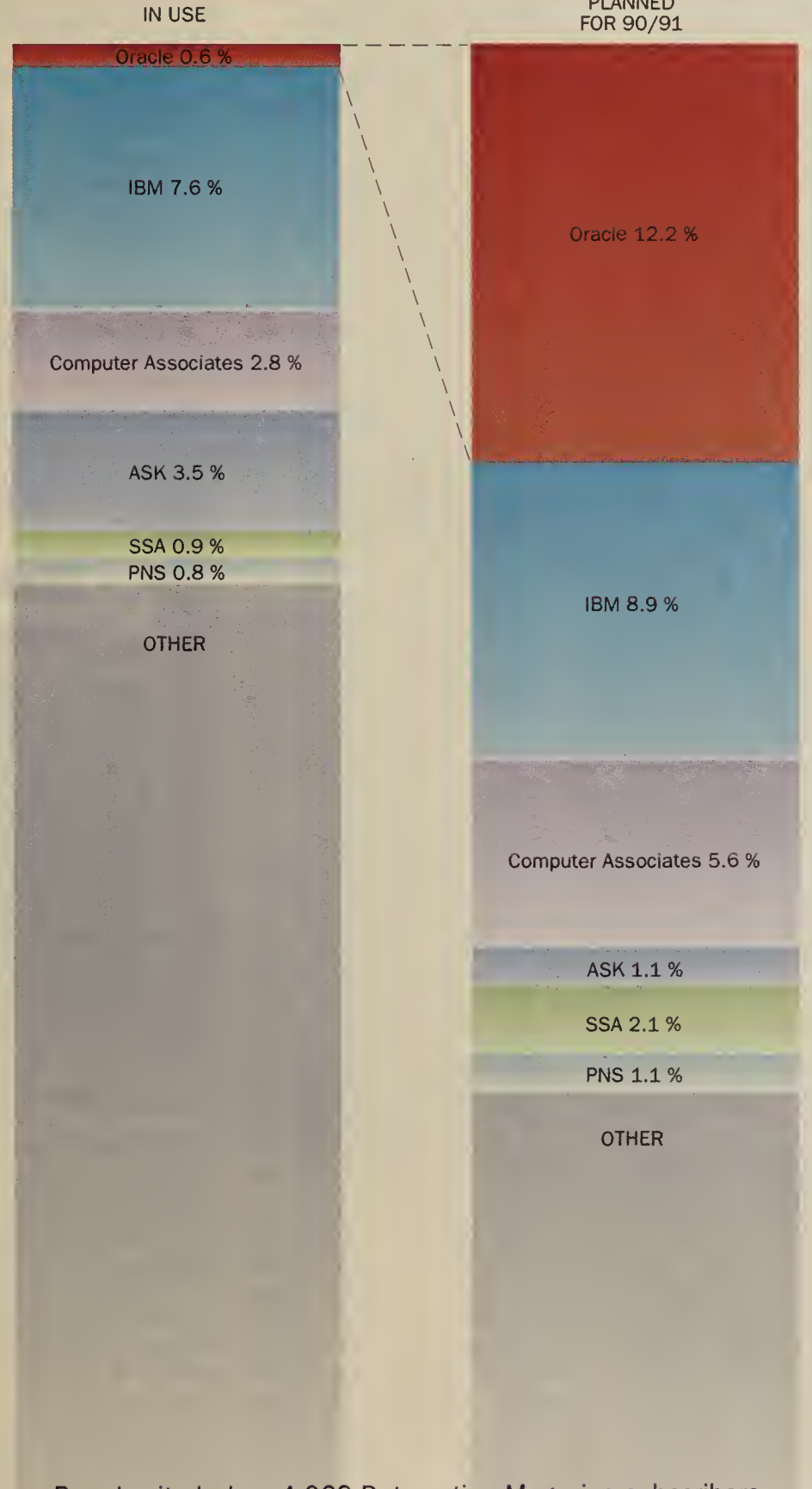
Call us, and register for the free Oracle Financials Seminar in your area.

1-800-633-1073 Ext-8120

You'll see why Oracle is accounting for all the growth in accounting.

ORACLE®

Software that runs on all your computers.



Brands cited when 4,062 Datamation Magazine subscribers were asked "Do you have in use now, or do you plan to use initially in 1990/91, Financial/Accounting software with your minicomputer/workstation system?*

©1991 Oracle Corporation. Oracle and Oracle Financials are registered trademarks of Oracle Corporation. ASK is a trademark of ASK Computer Systems, Inc. Computer Associates is a trademark of Computer Associates International, Inc. Datamation is a registered trademark of Cahners Publishing Associates, L.P. IBM is a trademark of International Business Machines. PNS is a trademark of Pansophic, Inc. SSA is a trademark of Systems Software Associates, Inc.
*©Datamation Mini/Micro Survey- September 1990. Call 1-800-ORACLE1 for hardware and software requirements. †In Canada please call 1-800-668-8925 for product and seminar information.

NEWS SHORTS

Swavely severs Compaq ties

Michael S. Swavely, the former president of Compaq Computer Corp.'s North American operations, retired last week, citing personal reasons. Swavely, 37, had surprised the industry by taking a six-month leave from Compaq in January. "I've spent a lot of years running at 150%, and I'm looking for a little bit better mix of pursuing personal goals and professional goals, as opposed to putting 100% of my efforts into professional goals," he said last week. Swavely said he had been approached to take chief executive officer or president positions at a number of computer industry firms but is not interested in operating positions. He plans to join the boards of several computer firms.

. . . . . .

NCR, AT&T plan new organization

Although their merger is still pending, NCR Corp. and AT&T last week outlined a framework for the combined organizations. NCR will split its general-purpose products group into a Large Computer Products Division responsible for NCR's System 3600 and 3700 parallel computers and a Midrange Computer Products Division responsible for the 3400 and 3500 multiprocessors and AT&T's System 7000, 3B2 and Star Server lines. NCR will add a Network Products Group, to be headed by AT&T Computer Systems Division executive William T. O'Shea. Also last week, AT&T announced that Robert M. Kavner, the group executive who orchestrated the company's takeover of NCR, would also assume responsibility for AT&T's Communications Products Group.

. . . . . .

Latest Wang cuts begin

A spokesman for Wang Laboratories, Inc. confirmed that employee reductions started last week. Wang executives recently announced that the company would reduce its worldwide work force by as many as 4,000 employees. While officials declined to give out actual numbers, sources estimated cuts at the Lowell, Mass.-based headquarters to have hit between 1,200 and 1,500 people.

. . . . . .

Troubled times for XL/Datacomp

XL/Datacomp, Inc., which at one time was the world's largest marketer of IBM midrange systems behind IBM, last week said it expects a flat third quarter and that it was discussing a merger with an unnamed company. The Hinsdale, Ill.-based value-added reseller has faced mounting losses since a contentious lawsuit against IBM last September and the subsequent end, in December, of its status as an authorized industry remarketer for IBM. The company's CEO said he thinks the worst is over.

. . . . . .

House advances wireless LAN bill

The U.S. House of Representatives approved a bill last week that would transfer 200 MHz of radio spectra to the private sector for uses such as wireless data communications, high-definition television and pocket telephones. A Senate version of the measure is pending but may ultimately be vetoed by the president over a dispute about how the scarce frequencies are to be allocated.

. . . . . .

Daimler-Benz eyes outsourcing role

Daimler-Benz AG may be about to escalate its already aggressive diversification agenda with a leap into the information services and outsourcing business. The German auto maker is poised to pay an estimated $300 million for a 34% stake in French Sogeti SA, controlling majority shareholder of computer services firm Cap Gemini Sogeti.

. . . . . .

NMI founder resigns

Network Management, Inc. founder Howard Frank stepped down as chairman of the Fairfax, Va.-based network systems integrator last week, handing over the reins to President and CEO Francis Dramis. Frank took NMI on an aggressive expansion-through-acquisition course since the company's founding in 1986.

More news shorts on page 80

Sale puts Pan Am outsourcing in limbo

BY KIM S. NASH
CW STAFF

NEW YORK — Pan American World Airways, which was spurned in its desire to outsource computer operations, must now decide what to do with its 500 information systems personnel.

As part of an agreement announced last Thursday, Pan Am agreed to sell most of its airline operations to Delta Air Lines.

Delta agreed to absorb 6,000 Pan Am employees, which "may include some data processing people," said Paul Lawrence, vice president of IS at Pan Am.

Atlanta-based Delta agreed to buy Pan Am's Shuttle, its routes from New York to Europe, Detroit to London and Miami to London as well as its Frankfurt operations, subject to approval from the court, Pan Am's creditors' committee and the boards of both airlines.

Pan Am scrapped plans to outsource its IS infrastructure after receiving "interest, but no formal proposals" from outsourcing vendors, Lawrence said.

As part of a Chapter 11 agreement filed in January, Pan Am must submit a corporate reorganization plan to the federal bankruptcy court here in September.

Early in the game

It is too early to tell how the IS department will fit into that reorganization, Lawrence said, because "we're still negotiating with other air carriers interested in buying our remaining assets."

If Pan Am continues to sell assets, there may be no IS staff left by September. "I don't think there is a sizable [IS] operation in the tea leaves," he said.

At least some of Pan Am's IS staff will move to other carriers, according to Lawrence, who took over Pan Am's top IS spot on June 1. He replaced Robert Wagner, who resigned in late May to become vice president of IS at Philadelphia's Consolidated Rail Corp.

Outsourcing would have provided a quick cash infusion to the financially strapped airline via the sale of data centers and other computer systems assets, said Rich Schmitt, president of Schmitt Consulting Group, Inc. in St. Louis.

However, money raised would probably have been "a pittance compared to the big bucks Pan Am can get by selling its flight routes," Schmitt said.

Pan Am's current murky financial future deterred potential outsourcing vendors from jumping on the offer. The airline cannot guarantee the long-term commitment of funds and other resources needed to make the deal attractive to an outsourcing company, according to Lawrence.

Originally cited as candidates for the estimated $500 million contract [CW, April 8] were Andersen Consulting, Electronic Data Systems Corp., AT&T and IBM's 2-month-old outsourcing subsidiary, Integrated Systems Solutions Corp.

Super Mario

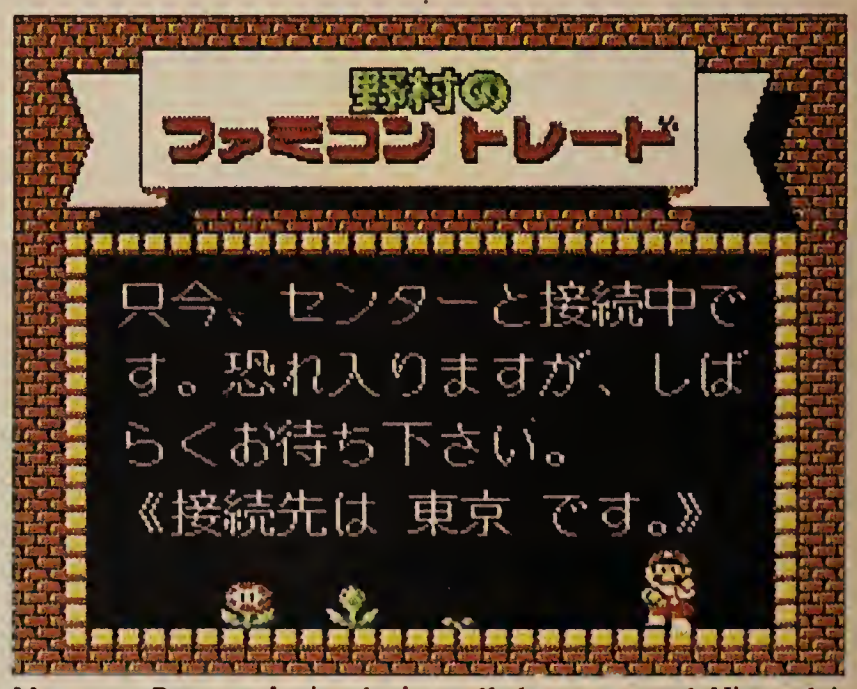
FROM PAGE 1

The system took off like wildfire following a trial test of 1,000 randomly selected users in late 1987. Trading on the network began the following July, and customers now number in the tens of thousands, although NRI declined to be more specific.

With plug-in software available free of charge from NRI and a network adapter/modem that snaps onto the computer and plugs into both a telephone and a 10-key controller pad, anyone can dial into the system with ease. All of the hardware, including the Famicom game system, costs about $270, with an additional $7.70 monthly network access fee charged by NRI and minimal telecommunications costs.

It has been a boon for Nintendo as well. "Most of the customers had purchased Famicoms already, but half of them bought a second one for trading, leaving the original one for the children," said Haruyasu Shiratori, project leader of home trading in NRI's strategic systems department. The read-only memory (ROM) cards come preprogrammed with network access and other information needed to use the system.

Nomura's VAN is not limited to trading stocks and convertible bonds. There are other ROM cartridges for home banking and damage insurance, for example. More applications, including an off-track horse race betting system, are planned for the future.



Nomura Research *is playing off the success of Nintendo's Mario Brothers video game for its stock-trading system*

Home stock trading is booming in Japan. Some 15 other securities houses have set up their own VANs, and another 30 are planning similar networks.

NRI's network is the pacesetter with 600,000 calls each month to search for different menus on the network, which uses two Tandem Computers, Inc. Nonstop computers. Some customers make as many as 30 trades per day, according to NRI data. Nomura has more than 5 million customers.

Customers can access information and trade convertible bonds and stocks listed on the Tokyo, Osaka and Nagoya stock exchanges, as well as tap into information on price trends in the New York market.

Nomura has big plans for its VAN. Focused around what it calls the Society of Famicom Communication Network, it aims to get 100 leading companies in various industries to offer services ranging from home shopping to ticket reservations and education. By November 1987, more than half of Japanese television watchers also used their sets for games, a number that is growing as TVs take center stage in Japanese home entertainment.

There have been sporadic efforts to launch a similar service in the U.S. Nintendo has teamed up with Fidelity Investments, a Boston-based fund manager, to develop software that will let U.S. users play the stock market or manage property. A Fidelity spokesman said the company has been working on some sort of trading program with Nintendo.

Valigra is the Tokyo bureau chief for the IDG News Service.

To The Most Advanced RDBMS, It's Just Another Server.

Client/server computing integrates the powerful, graphical capabilities of desktop workstations with the proven data storage and processing capabilities of mainframes. Client/server computing, in essence, turns mainframes into servers.

But turning mainframes into servers creates two tough problems: Preserving MIS control over corporate data. And integrating existing applications with new ones.

Only SYBASE® solves both problems.

Unlike most RDBMS gateways, SYBASE gives MIS complete control over mainframe data, applications, and services by providing desktop access transparently through CICS—ensuring that all requests meet current transaction management, security, and monitoring requirements. In addition, SYBASE allows MIS to regulate network access to specific transactions, regions, and data sources. With SYBASE, MIS is always in control.

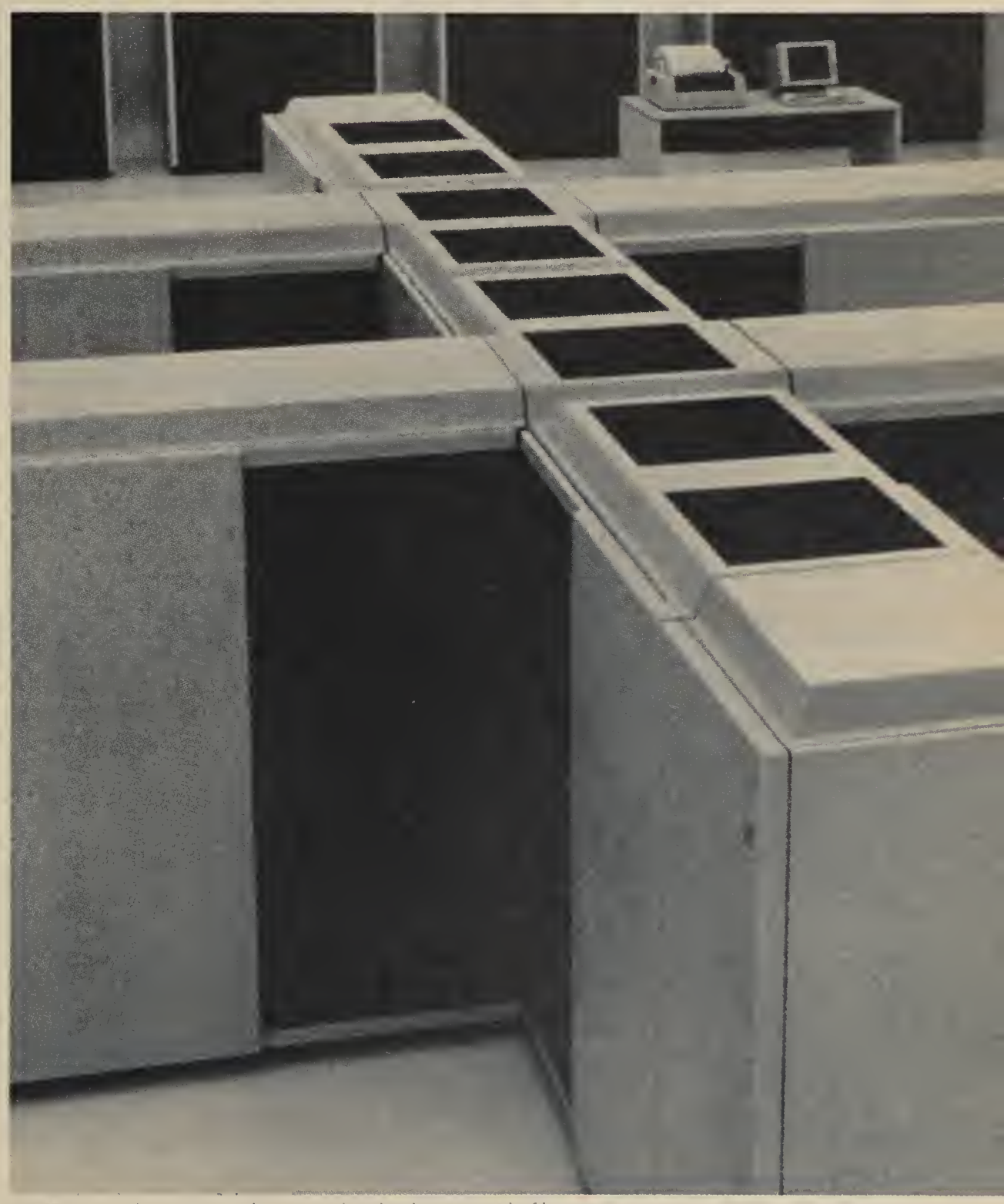
SYBASE also leverages the investments made in existing mainframe applications. SYBASE integrates new, LAN-based applications with mainframe applications written in COBOL, PL1 or Assembler, as well as with all data sources and services accessible from CICS, such as DB2, IMS/DB and VSAM. With SYBASE, existing mainframe applications don't have to be rewritten.

SYBASE is the only product that lets you effectively turn your mainframes into servers as you deploy new LAN-based applications on VAXes, UNIX, OS/2, and DOS-based platforms, Macintoshes, and others.

What's more, our professional services division, SQL Solutions, can help you design, develop, and integrate complete multi-vendor relational systems for your on-line, enterprise-wide computing environment.

To find out more, call and register for a Sybase Educational Seminar near you. Because the time to turn your mainframes into servers is now.

Just call 1-800-8-SYBASE.



© Sybase, Inc. 1991 Other company or product names may be trademarks or service marks of their respective companies.

SYBASE®

Client/Server For The On-Line Enterprise

Free! "Integrating The Mainframe." It's our latest, most comprehensive information kit. For your copy, please mail this coupon to: Sybase, Inc., Dept. S, 6475 Christie Ave., Emeryville, CA 94608. **Or call 1-800-8-SYBASE.**

Name_____

Title_____ Company_____

Address_____

City_____ State_____ Zip_____

Dbase

FROM PAGE 1

Angeles. "Dbase has become sort of the de facto standard in many cases. Whether that's good or bad is almost secondary to the fact that you have a large body of users out there that know it."

The $439 million purchase move also stunned some industry observers. In recent years, the aggressive and technologically savvy Borland has made steady gains against Ashton-Tate, a onetime powerhouse that has stumbled badly.

"It's a bit perplexing as to why Borland would pay all that much money for something [an installed base] they were going to get for free," said Frank King, senior vice president for software products at Lotus Development Corp. in Cambridge, Mass.

How Borland benefits

The move does buy Borland Dbase's enormous installed base of approximately 3.5 million users, or about 47% of the total installed base of PC data management software, according to International Data Corp. (IDC).

The purchase also propels 8-year-old Borland into the top tier of PC software makers, with annual combined company sales of about $500 million. With the acquisition, Borland now controls more than 60% of the $500 million-per-year PC data management market, IDC said.

Kahn said he will keep both Paradox and Dbase alive and then take both sets of customers to a new generation of software (see story below right). The customer migration path will be paved by the Object Dbase Compiler, which will act as "the glue between the two databases," said Rob Dickerson, general manager of Borland's database business unit. No shipping date has been established for the compiler.

Borland also jumped into the client/server market recently with a Dbase IV front end for Microsoft Corp.'s SQL Server.

But the future of other Ashton-Tate products is uncertain. "The direction of Borland has and will continue to be database management, languages and spreadsheet packages," Kahn said. He made no guarantees about the longevity of Ashton-Tate products such as the Applause presentation graphics package or Framework business package.

Michael Irwin, a systems analyst at the Metropolitan Police Department in Washington, D.C., said he believes both Applause and Multimate, Ashton-Tate's word processing offering, are not long for this world. "I hope Borland won't scrap Applause, but I have a feeling they probably will," he said. Borland appears to be setting its sights on a much larger jewel: the corporate database market. The purchase brings with it Ashton-Tate subsidiary Interbase Software Corp., which offers a multiuser relational database management system.

"Borland is buying entry into the midrange," said Nancy McSharry, an analyst at IDC. "Oracle [Corp.] is a $1 billion company, and we like to pick a fight with the bigger guys," Kahn said.

The acquisition is the latest episode in a rapidly consolidating industry. Many blame the contraction on the success of Microsoft.

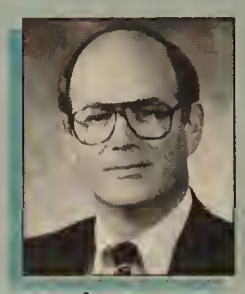
"Microsoft's competence and aggressiveness are forcing condensation in the industry," said Dave Fulton, president of Fox Software, Inc., which is being sued by Ashton-Tate for copyright infringement. "In five years' time, Borland will be face-to-face with Microsoft," Fulton said.

In the meantime, deep cuts are expected in Ashton-Tate's 1,700-person work force; Ashton-Tate President William Lyons is expected to depart after a brief transitional phase.

At a glance

Borland

Headquarters
Scotts Valley, Calif.
Employees
1,122
(last reported full year)
Revenue
$226.8M
Profits
$26.8M
Major products
Paradox
Quattro Pro
Objectvision
C++ and
various compilers



Ashton-Tate

Headquarters
Torrance, Calif.
(Subsidiary: Interbase
Software Corp.
Bedford, Mass.)
Employees
1,700
(last reported full year)
Revenue
$230.5M
Profits
$-18M
Major products
Dbase III, III+ and IV
Full Impact (Mac spreadsheet)
Applause II
Framework
Multimate
Fullwrite Professional

CW Chart: Janell Genovese

Clout

FROM PAGE 1

slashes development time by allowing blocks of software code to be easily recycled from program to program.

Since switching to the program, Borland has built and released applications at a dizzying speed. It was object-oriented programming that allowed it to release the Quattro Pro Version 3.0 spreadsheet [CW, April 1] only five months after the product's previous edition. It was also object-oriented programming that let Borland release its third generation of the C++ programming language when Microsoft Corp. was shipping its first.

Borland Chairman and Chief Executive Officer Philippe Kahn said the increasing complexity of writing software will demand the use of object-oriented programming techniques. "Object-oriented techniques allow programmers to focus on the essential parts of their job rather than deal with annoying details," he said. "It's a technology that's going to be key to making this merger happen."

The Dbase programming language has proved very flexible. Dbase IV is available for the DOS, Apple Computer, Inc. Macintosh, Digital Equipment Corp. VAX and Sun Microsystems, Inc. platforms and for the five desktop flavors of Unix.

Future joint product offerings are also likely to use the most efficient portions of the Dbase and Paradox database and strip away the inferior segments.

Dbase IV, for instance, has poorer network performance than Paradox because it uses a technique that does not group reports together but instead deals with them individually. Paradox also has a well-regarded query-by-example facility that makes it simpler to formulate customer queries.

Much of these design improvements can be attributed to Borland's proprietary virtual real-time object-oriented memory manager technology, which uses object-oriented development principles to swap portions of complex programs in and out of computer memory efficiently.

Paradox is also closely linked with Quattro Pro. For example, Quattro Pro can make queries directly to data stored in the Paradox database engine. That connection could turn out to be a strong selling point — Borland plans to arm Quattro Pro with more attractive features as it aggressively pursues Lotus Development Corp.

The glue that binds

Borland's Object Dbase Compiler will provide a bridge for Dbase users

- Dbase III+-compatible and IV-compatible.
- Windows language extensions.
- Includes compiler and interpreter.
- Creates applications for both Microsoft Corp.'s Windows and DOS.
- Includes resource workshop.
- No set delivery date or price.

Source: Borland International, Inc. CW Chart: Tom Monahan

Users hope for stability

For Dbase users, the most important thing Borland can do with its Ashton-Tate acquisition is make sure business continues as usual. "Frankly, I don't care what happens as long as my users don't need to be retrained and my software still works," said Jack Detrick, director of data processing at Centinela Hospital in Los Angeles.

"What I would like to see is a best of both worlds," said Michael Irwin, a systems analyst at the Metropolitan Police Department in Washington, D.C. "I love the Dbase language, but the interface falls short when compared to Paradox's."

Borland intends to ease the transition in a version of Paradox for Microsoft Corp.'s Windows, which is expected by the end of the year. The graphical product will allow applications to share data by snapping into a common "object layer" without using the Paradox engine. The new design will also let users directly use the companion SQL Link product to get at Structured Query Language data.

But some users are not entranced with the idea of a Windows database.

"I don't need to sit there with a mouse and draw boxes when I'm doing queries," said Rock Blanco, vice president of information systems at Garber Travel in Boston.

JAMES DALY and
CAROL HILDEBRAND

Will Borland suit up?

There may be another big winner in the Borland buyout of Ashton-Tate: the Dbase clone industry.

Ashton-Tate has proved itself willing to do battle with any company it feels infringes on the Dbase copyright, but Borland's Chairman and CEO Philippe Kahn said he shares no similar litigious streak. "There are far better things to do than litigate," Kahn said. "Beat them with technology and forget the lawyers."

That attitude could remove a cloud hanging over Fox Software, which since November 1988 has battled Ashton-Tate's charges that its Foxbase product unlawfully copied characteristics of Dbase.

Observers said it would be difficult for Borland to pursue the suit when Borland is the defendant in a copyright infringement suit filed by Lotus.

Dbase users have not been wholly supportive of the Fox lawsuit, claiming that in recent years, Ashton-Tate has failed to improve on its technology and has used the courts — rather than the research and development laboratories — to protect its products. "We count on database packages to be similar because we've got a lot of time and training invested in using and integrating them," said Roland Murphy, an engineer at the Resources Conservation Co. in Bellevue, Wash.

Users are also fearful that if a legal precedent is established for claiming proprietary rights to a programming language or a program's sequence of events, it could threaten the open base of all programming.

A trial date has not yet been set for the case, but Ashton-Tate CEO William Lyons said the company had originally hoped to settle the case by negotiating "an appropriate business solution," including the possibility of securing a licensing agreement that would include royalty payments from Fox.

David Fulton, CEO at Perrysburg, Ohio-based Fox, has waved away such ideas. "There is not a line of code in common between our product and theirs, so I don't know who would need to pay royalties."

JAMES DALY

KEEP THIS TO YOURSELF

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

Address Shown: ☐ Home ☐ Business

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____

City _____ State _____ Zip _____

Please answer questions to qualify for this rate.

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finence/Insurence/Real Estete
   - 30. Medicine/Law/Educetion
   - 40. Wholesale/Reteil/Trade
   - 50. Business Service (except DP)
   - 60. Government - Stete/Federal/Local
   - 65. Communicetions Systems/Public Utilities/ Trensportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufecturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Reteiler
   - 75. User: Other _____ (Please specify)
   - 95. Vendor: Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)

   IS/MIS/DP MANAGEMENT
   - 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - 21. Dir./Mgr. MIS Services, Information Center
   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Suprv. of Programming, Softwere Dev.
   - 32. Progremmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Finenciel Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales & Mktg. Menegement

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educator, Journalists, Librariens, Students
   - 90. Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all thet apply)
   Types of equipment with which you are personally involved either es e user, vendor, or consultent.
   - A. Mainfremes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Locel Area Networks
   - F. No Computer Involvement

Basic Rate: $48 per year. *U.S. Only

E2128-0

Recycled Paper

COMPUTERWORLD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

June 25, 1991

Candle and our largest customer, IBM, are now SystemView Development Partners.

...Expanding the power and performance of SystemView.

The Family of Candle Products:

- *Performance (OMEGAMON,® OMEGAVIEW™)*
- *Automation (AF/OPERATOR,® AF/PERFORMER™)*
- *Application Access (CL/CONFERENCE,® CL/SUPERSESSION®)*

Call 1-800-262-8968 to listen to the development announcement/analysis and to receive information.

IBM® and SystemView™ are trademarks of International Business Machines Corporation.
Copyright © 1991 Candle Corporation. All Rights Reserved.

Candle®

Making your systems perform

Computers tackle gridlock in Chicago

BY ELLIS BOOKER
CW STAFF

SCHAUMBURG, Ill. — In its largest experiment yet to cut down on metropolitan gridlock, a federal agency last week announced it will put driver's side computers in 4,000 to 5,000 automobiles in the Chicago area.

In addition to area maps stored on compact disc/read-only memory in the in-car computer, drivers participating in the Advance project will have access to real-time traffic information and routing "advice" over a radio network. The Federal Highway Administration said it will use a global positioning system satellite and sensors embedded in the road to monitor the location and movement of traffic over a 200-sq-mile area.

The test, scheduled to begin operation in early 1993, will be conducted in Chicago's northwestern suburbs, including the notoriously jammed roads around O'Hare International Airport.

At a projected cost of $35 million to $40 million over five years, Advance — formally titled the Advanced Driver and Vehicle Advisory Navigation Concept — is the most ambitious test yet of Intelligent Vehicle Highway System (IVHS), one prototype of which has been implemented in Los Angeles and another is slated for use in Orlando, Fla.

According to Dennis Judycki, associate administrator for safety and system applications at the Federal Highway Administration, the federal budget for IVHS projects has grown from $3 million last year to between $20 million and $24 million this year. For 1992, Judycki's department has put in a request for $60 million.

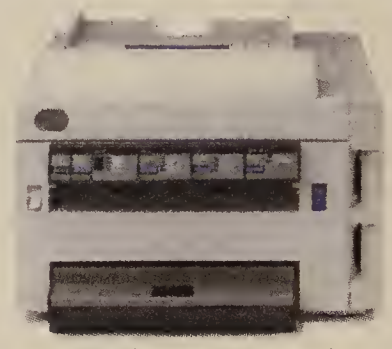
Like the other IVHS projects, Advance is a public-private partnership. Approximately 50% of the funding will come from the Federal Highway Administration, 25% will come from the Illinois Department of Transportation, and 25% will come from the private sector.

The private sector participants include a university research consortium and Motorola, Inc., which will install and maintain the in-vehicle navigation and route guidance systems in the cars. Motorola will also provide a two-way radio frequency data network linking the cars to a central traffic information center.

The center, which will be operated by the Illinois Department of Transportation, will provide up-to-the-moment traffic information to the computers in the cars.

Recruitment of drivers for Advance will begin next year.

The IBM LaserPrinter.



Other than being
25% faster,
with a smaller footprint,
and powerful options like
3 paper input sources,
3½ times the paper capacity,
5 times the envelope capacity,
and automatic collating,
it's a lot like the
HP LaserJet III.

There are lots of features that distinguish us from our competition.
See the IBM® LaserPrinter at your dealer, soon. You may find the price to be the most distinctive feature of all. For the dealer nearest you, call 1 800 IBM-2468, ext. 874.

Suddenly, nothing else measures up.

LaserPrinter

A product of Lexmark.

IBM printers are manufactured and distributed by Lexmark International, Inc. under license from International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corporation. HP and LaserJet III are registered trademarks of Hewlett-Packard Corporation. ©1991 Lexmark International, Inc.

Lanalyzer moves to Netware beat

BY JIM NASH
CW STAFF

Like a dinghy behind a cabin cruiser, Novell, Inc.'s network analysis tool is being pulled along in the wake of Netware 3.11. The Provo, Utah-based networking firm introduced Version 3.11 of Lanalyzer last week to the applause of early users.

Actually, Lanalyzer is one of several products feeling the pull of Netware 3.11. Last month, Novell began shipping Netware for IBM's Systems Application Architecture, software that plays off of 3.11's 32-bit, multivendor nature.

Novell said the new, pricier Lanalyzer, which updates only the product's software, will be shipped later this month with support for five new protocols. The additions bring it in line with protocol support available on Netware 3.11, said Duane Murray, vice president and general manager of the company's Network Analysis Products Division.

The product analyzes Netware and non-Netware network activity, including packets generated by Server Message Block, Banyan Systems, Inc.'s Virtual Networking Software, Open Systems Interconnect, IBM's Systems Network Architecture and Netware 3.11.

The new version offers more information on packets, or messages, captured as they tear around a network, said Jim Zboncak, a network support analyst at FMC Corp. in Chicago. On the initial summary screen, Zboncak said, managers can see, for example, which server is sending a given file. That is key, Zboncak said, when a network administrator is pressed to resolve network problems quickly.

Luckie Ford, a systems analyst at the M. D. Anderson Cancer Center in Houston, said he tried a Network General Corp. Sniffer analyzer and found the Lanalyzer easier to use, especially on the center's 60 Netware networks.

The Lanalyzer has a help desk-style application that assists managers as they troubleshoot or resolve actual problems, Ford said. The feature prompts users to take certain actions and explains alerts. Token Ring and Ethernet versions of the Lanalyzer cost $12,500 with ABM/AT network interface cards and software, up from $9,980 for Ethernet and $11,980 for Token Ring. Combined Ethernet and Token Ring versions cost $19,980, up from $19,900.

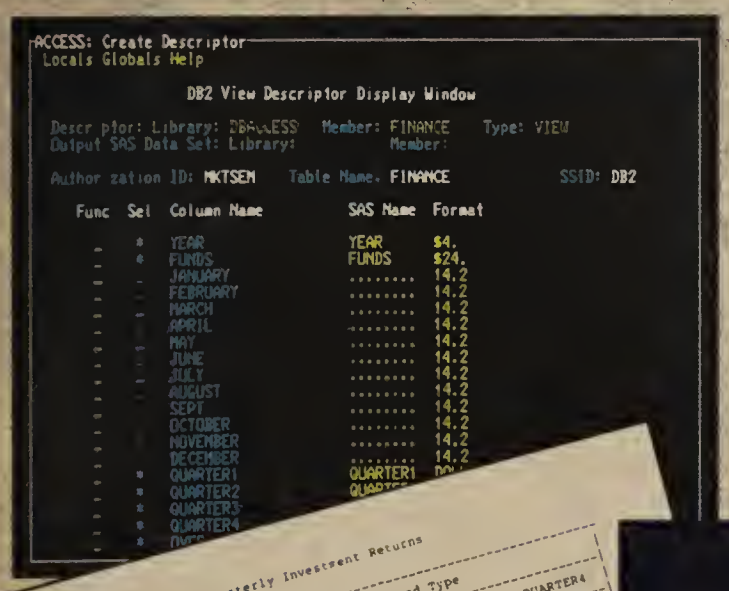
Now Your Company's Islands of Information are Within Easy Reach.

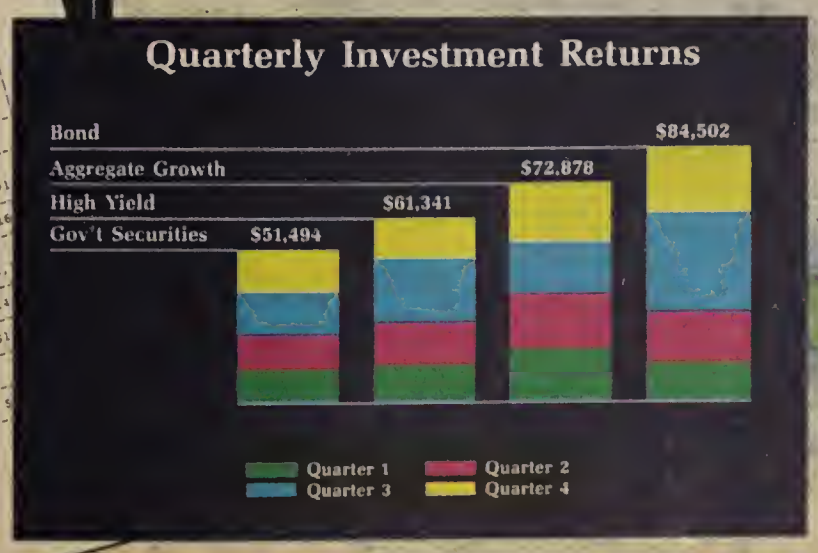
Announcing the SAS® System's Transparent Data Access

If you spend more time getting *to* your data than getting information *from* your data, it's time you got the SAS System—the world's #1 applications system. No other software makes it so easy to reach all the remote islands of information within your company—or to analyze and present data in so many different ways.

The SAS System's exclusive Multiple Engine Architecture lets you access data stored in a variety of structures across a wide range of hardware platforms . . . without having to know data base terminology or sacrificing data base security. Easy-to-follow menus take you inside DB2, SQL/DS™, ORACLE®, Rdb/VMS™, Lotus 1-2-3®, dBASE®, SYSTEM 2000®, and other data bases. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. You can also use the SAS System to access raw data files in any format—even files with messy or missing data.

Once you've accessed your data, the SAS System's integrated data analysis, reporting, and graphics capabilities will help you turn bare facts into meaningful business information. Choose from such applications as forecasting . . . operations research . . . project management . . . quality improvement . . . and more. All backed by expert technical support, consulting services, documentation, and training—direct from SAS Institute Inc., one of the world's most respected names in software.





Call us now at (919) 677-8200 to receive your free SAS System executive summary . . . plus details about a free no-risk 30-day software trial. In Canada, call (416) 443-9811.

NEW
SAS® Applications System
Executive Briefings
Call for Details
919-677-8200

The SAS® System

SAS®

SAS Institute Inc.
Software Sales Department
SAS Campus Drive
Cary, NC 27513
Phone 919-677-8200
Fax 919-677-8123

The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

SAS is a registered trademark of SAS Institute Inc. Other brand and product names are registered trademarks or trademarks of their respective holders.

Copyright © 1990 by SAS Institute Inc.
Printed in the USA.

SYSTEM 2000®

K Mart shops for Unix discount

BY ELLIS BOOKER
CW STAFF

TROY, Mich. — On schedule with a massive, nationwide deployment of Unix servers based on Intel Corp.'s I486, K Mart Corp. will decide in a week or two whether to buy the next 1,250 of those systems from its current supplier, Unisys Corp., or to switch to an as-yet-unreleased system from NCR Corp.

According to David M. Carlson, senior vice president of corporate information systems at K Mart, the choice is between the Unisys U Series 6000/65 and the NCR System 3000 Model 3450.

Although Carlson stated he has been very happy with Unisys' performance thus far, his decision may come down to which vendor gives him the best price. One of his jobs, he quipped, is to be "ruthless" about getting deep discounts from vendors for bulk purchases.

Another item that may figure into his decision is K Mart's commitment to the Intel architecture. By the end of 1992, the retailing giant plans to own some 3,500 486-based computers as well as 4,500 80386-based and 5,000 80286-based computers. Specifically, Carlson said he is watching with interest NCR's plans to deliver massively parallel Intel-based systems with the performance characteristic of traditional mainframes.

"We are intrigued with the potential cost savings that may accrue from that architecture," Carlson said. At the moment, K Mart has no active projects moving applications from its IBM and Amdahl Corp. mainframes to parallel computing.

K Mart's Carlson: *'Ruthless' about getting vendor discounts*

NCR's 3450, a one-to-four processor, 486-based, 50-MHz machine, is scheduled for customer availability in the fourth quarter of this year, according to an NCR spokesman.

Unisys' U6000/65, announced in April, is a 33-MHz, 486-based server able to use one to five processors. Customer deliveries began last week.

Although the U6000/65 is currently a 33-MHz platform, the entire U6000 product line (with the possible exception of the entry-level U6000/10, a two- to four-user system) will be upgraded to the Intel 50-MHz chip by the first of the year, Unisys said last week.

K Mart has already deployed half of the 1,000 U6000/60 servers it has on order from Unisys.

Whichever vendor wins the latest K Mart contract, the 1,250 servers will join those already being used in the K Mart Information Network II (KIN II), an inventory management system that the retailer began deploying last year.

KIN II seeks to keep empty shelf space to a minimum by more precisely matching the inventory on store shelves to the buying habits of shoppers.

In addition to some 500 Unisys U6000/60s in its retail stores, K Mart has deployed 2,250 Unisys 386-class platforms. All of the in-store computers are linked over Token Ring networks and are connected to the corporate office over a GTE Spacenet Corp. satellite network.

Applications for KIN II use the Informix Corp. relational database language; they replace hundreds of assembler language-based merchandising programs in an earlier scheme called KIN I.

A Few Minutes Of Downtime Can Have A Devastating Effect On A Vital System.

A company's computer system is the very heart of its operations. But let it respond slowly to its users, and you'll hear complaints up and down the halls. Let it go down for any length of time, and you'll find cases of cardiac arrest, right there in the data center.

So it is good news, indeed, that Goal Systems offers a software solution that can dramatically enhance on-line availability.

OPS/MVS. A KEY STEP TOWARD THE AUTOMATED DATA CENTER.

OPS/MVS is the premier ASO (Automated Systems Operations) product. With it, data center personnel can become true proactive managers—providing greater on-line systems availability, reducing human error and making more cost- effective use of their computer resources.

Among the benefits of OPS/MVS are consistent operator response, console consolidation, automatic application and subsystem start-up and shut-down, beeper notification, automatic problem record generation, intervention-free IPL and more.

For all the details on the industry's most technically advanced system automation software, phone our toll-free number. With OPS/MVS, you'll never miss a beat again.

(800)829-9002

GOAL

GOALPLEX FOR ASO
OPS/MVS
SAR
EXPRESS DELIVERY
JOBTRAC
EPIC
ARISE II
FAQS
FAQS/PCS
FAQS/ASO

GOALPLEX FOR DB2
INSIGHT
FAVER
DB·DELIVERY
IN2ITIVE
PREVIEW

GOALPLEX FOR RESOURCE OPTIMIZATION
EXPLORE
CICS/EXPRESS
APAS·PLUS
EXTEND/VSE

GOALPLEX FOR INTEGRATED STORAGE MANAGEMENT
MASTERCAT
FAVER
VSAMAID
HYPER·BUF
EXTEND/DASD
CREWS
PDSMAN
FLEE

GOALPLEX FOR SYSTEMS ASSURANCE
ALERT/VSE
ALERT/VM
ALERT/CICS

Our Application Generator Solves The Two Toughest Problems In Software Development Today.

On time, on target. Promises often made but rarely kept. Unless you use APS, the full-function, "industrial strength" application generator from INTERSOLV.

A CASE tool for the '90s, this new technology lets you prototype, build and test on the desktop using PC-DOS or OS/2 with Presentation Manager – quickly and efficiently.

APS is also the *only* application generator that supports multiple development cycles in a LAN-based environment.

Just as important, APS lets its 10,000 users from many of the world's largest corporations target applications where they choose – mainframes, minis and PCs. And, unlike CASE vendors who force you to use one rigid methodology, APS adapts to *your* way of doing business, which saves you from significant production delays and re-training costs.

Some APS Customers

Alcoa
Bardays Bank
BMW Limited
Boeing
Mellon Bank
PaineWebber
Royal Insurance
Time Warner
U.S. Sprint

What's more, like all of our products – Excelerator Series for analysis and design, PVCS Series for configuration management and Design Recovery Series for Re-Development – the APS Series works standalone, with other INTERSOLV products, or can be "snapped" into your current culture.

Add to that our commitment to an open architecture and adherence to industry standards such as IBM's AD/Cycle, and you finally have a powerful, yet easy to learn application generator that more and more developers are calling the *true* engine of CASE.

IBM Business Partner

But don't take our word for it, ask our users. They will gladly tell you how well APS works to shrink development schedules by as much as 40% to ensure the on time, on target delivery of high impact IS solutions.

If you want to build applications on the desktop for IBM SAA environments, you need APS. For more information and a *free* management report entitled, "Guide To Implementing Application Generator Technology," call us toll-free at **1-800-547-4000** ext. 901. Or write, INTERSOLV, 3200 Tower Oaks Boulevard, Rockville, Maryland 20852.

INTERSOLV

The CASE Company You've Been Waiting For:

INTERSOLV, Excelerator, Design Recovery, APS and PVCS are registered trademarks of INTERSOLV, Inc. IBM is a registered trademark, and AD/Cycle and SAA are trademarks of International Business Machines Corporation

Neural nets all business at conference

At international expo, IBM and Intel showcase business applications for neural networks

BY DAVID KELLY
SPECIAL TO CW

SEATTLE — Neural network products are coming out of the laboratories and moving into the business world. IBM and Intel Corp. joined some 30 companies exhibiting neural network products here last week.

The fourth International Joint Conference on Neural Networks drew IBM for the first time. The company's Application Business Systems Division demonstrated its Neural Network Utility program and said the product is now generally available.

Neural network technology is a concept aimed at mimicking the human brain's complex, interconnected network of neurons.

The IBM product will run on DOS with Microsoft Corp.'s Windows 3.0, OS/2 and the Application System/400. The utility is priced at $1,000 per workstation and is also included in the lastest release of the OS/400 operating system.

Joseph Bigus, senior associate programmer at the IBM division, said the product is aimed at providing business users with pattern recognition, predictive modeling and forecasting abilities.

Churchill Systems, a Troy, Mich.-based IBM business partner, used the IBM offering to develop a neural network product designed to sort through a large database and cull a list of potential clients.

The product identifies key characteristics associated with a customer's best active clients and then sorts through inactive client lists to find those that match the desired attributes.

San Diego-based HNC, Inc. unveiled a product dubbed the Database Mining System. Running on personal computers under Windows or Sun Microsystems, Inc.'s workstations, the product analyzes the data in a database until it has "learned" all of the relationships that exist among data elements, the company said.

According to HNC, a large New York bank has been using a prerelease version of the database product to create a model for automated credit scoring and risk analysis. HNC did not release specific pricing information about the product.

Boeing looks for savings

At The Boeing Co., neural network technology is being used to identify previously designed and manufactured parts that closely match newly designed parts, according to Thomas Caudell, senior researcher at Boeing Computer Services.

With each aircraft design requiring exact specifications, the company hopes to save up to 80% on the cost of new parts by using existing parts when possible, Caudell said. Designers work according to a new aircraft design specification and submit their drawings to a "design server" that matches it against a catalog of existing parts; a list of close matches is returned to the designer, who can then use or modify an older version or continue to go ahead with a new specification.

Also at the conference, Intel demonstrated its Electronically Trainable Analog Neural Network chip. The first neural chip product developed by the company, it has so far been integrated into a real-time image processing board for PCs and is priced at $940.

Kelly is a Waltham, Mass.-based freelance writer.

Answer tools port to Nonstop SQL

CUPERTINO, Calif. — Tandem Computers, Inc. and Sterling Software, Inc. last week announced a joint marketing agreement under which Sterling's IBM-compatible Answer API software tools will be ported to Tandem's proprietary Nonstop SQL relational database systems.

After the gateway products become available sometime this fall, Sterling's sales force will be referred to customers who want to install new Tandem systems alongside IBM mainframes.

Among the databases supported are IBM's DB2 and SQL/DS relational databases, IBM's IMS hierarchical database, Computer Associates International, Inc.'s IDMS and Software AG of North America, Inc.'s Adabas.

Answer API, a tool made by Sterling's Answer Systems Division in Woodland Hills, Calif., will be used to convert Tandem SQL statements into IBM 3270 requests to the target IBM databases, according to the company.

"There are separate modules to deal with each of the [target] databases," said Brian Conley, director of third-party marketing at the Answer Systems Division.

Answer API can be used to extract data from several different databases and then combine it in a single Answer application, Conley said.

Open The Box

Now Ross uses Digital's NAS to open business ties.

Now there's a way to tie your existing applications together — without tying your organization in knots. It's Digital's Network Application Support (NAS), a set of standards-based software that enables Ross Systems financial, distribution and human resource applications to work with the departmental and end-user systems you already have. No matter what their stripe.

That's why Ross builds applications on Digital's NAS software. Because its functionality, ease of implementation and portability puts our software solutions to work on Macs,® VAX™, PCs and UNIX®. So organizations can integrate MIS and access company-wide information, without losing control of it.

In fact, we're already using NAS to help our customers do just that. Freeing departments to use our financial, distribution and human resource applications on Macs and PCs, while accessing corporate data on a mainframe. Transparently.

As a leading provider of software solutions for Digital computers, Ross Systems is now open to change with NAS. So no matter how technologies, platforms and communications change, your business — and the critical applications that keep it running — won't have to. For more information on how Ross NAS-based software can tie your company together, call (404) 257-9198 Ext. 130 today.

digital™ Cooperative Marketing Program

"Opening up the best financial, distribution and human resource software for Digital computers."

ROSS SYSTEMS

The Ross Systems logo is a trademark of Ross Systems Inc. The Apple logo and Mac are registered trademarks of Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corporation. The Digital logo and VAX are trademarks of Digital Equipment Corporation. UNIX is a registered trademark of UNIX System Laboratories, Inc.

There are things about buying a networking system that most people don't know when they buy one.

Critical things.

So we've written a booklet, "Things they don't tell you at Novell presentations."

You'll find information no one else will give you. Information about technology unique to Banyan and advantageous to you.

This booklet will show you opportunities–and pitfalls–you may be unaware of now:

Distributed Architecture.

Why Banyan can offer you almost effortless growth. And the others can't.

The Man Trap.

Why competitive network operating systems require more and more LAN administrators. And Banyan doesn't.

Hidden Costs.

This part will make your hair stand on end.

Banyan has been refining its VINES® networking products for years. Our solutions are stronger, broader, and more cost-effective than anything else out there. So,

-if you're buying a networking system for the first time...

-if you're expanding...

-if you're wondering why you need so many people to manage the system you have now...

-if you're presently considering only Novell...

...Please call the toll-free number below for immediate delivery of your free booklet or to arrange a demonstration.

BANYAN®

Networking. Without Limits.™

Please send this coupon to: CW
BANYAN, 120 FLANDERS ROAD, WESTBORO, MA 01581

NAME

TITLE

COMPANY

ADDRESS

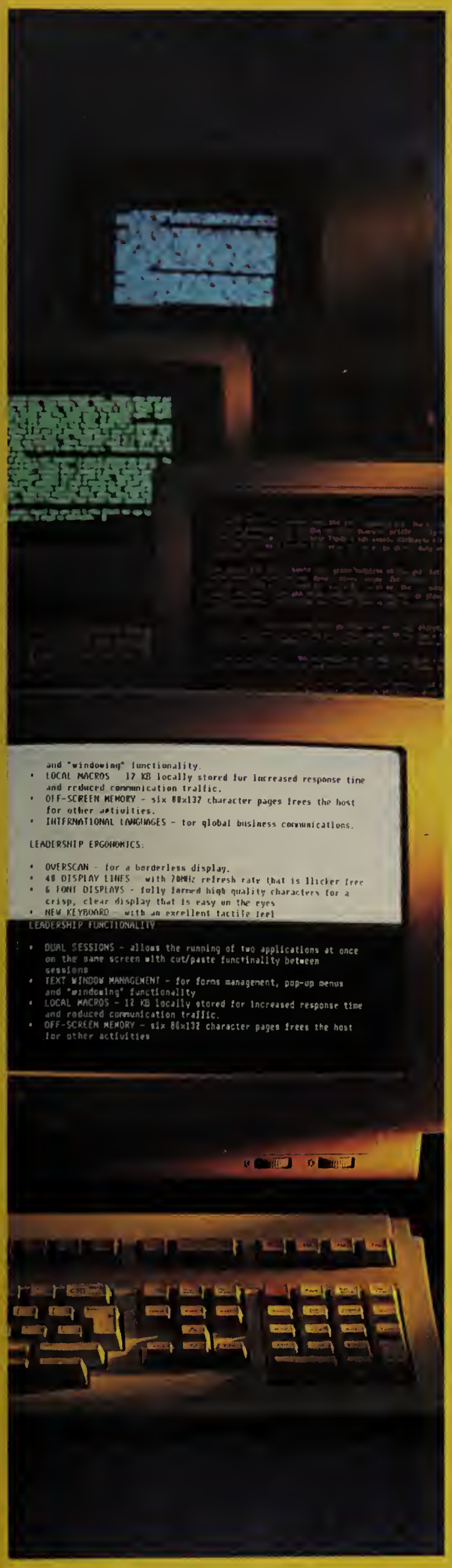
CITY

STATE ZIP

CALL 1-800-828-2404
In Massachusetts: 508-836-2828

DIGITAL'S LONG LINE OF AWARD-WINNING TERMINALS JUST GOT EXTENDED

DIGITAL. THE OP



The VT™ 420 has won Digital Review's 1991 Target Award for best text terminal based on functionality and ergonomic design. With four generations of leadership terminals, Digital has consistently set the standards for excellence and reliability.

DIGITAL ON TARGET AGAIN WITH VT420.

1991 digital review TARGET AWARDS WINNER

The VT420 features text windowing capabilities that let applications display and manipulate information on screen and in local memory more efficiently. Forms management, pop-up menus and help messages enhance the interface and response times for improved productivity. The VT420 also offers single-wire, dual-session functionality for using two applications simultaneously. Information can be "copied and pasted" within or between sessions. Additionally, the VT420's six pages of off-screen memory, local macros, communications speeds to 38.4K baud rate, and international languages make it a world-wide leadership terminal.

Six fonts, all displayed at a flicker-free 70hz refresh rate, up to 48 display lines, overscan, and a new keyboard provide the award-winning ergonomics that increase user productivity and comfort.

All this at a very competitive price.

Outstanding performance. Exceptional ergonomics. The VT420 continues the tradition. To learn more about Digital's award-winning VT420 text terminal, call 1-800-343-4040, ext. 407. Or call your Digital Authorized Distributor. digital™

EN ADVANTAGE.

© Digital Equipment Corporation 1991. The DIGITAL logo and VT are trademarks of Digital Equipment Corporation.

Black & Decker revs quality tool

IS department uses 'total quality management' as bridge to users

BY NELL MARGOLIS
CW STAFF

TOWSON, Md. — It doesn't take Black & Decker Corp. to tell you that when you spend good money on a tool, it had better work.

Late last month, however, the $4.8 billion firm's corporate information systems department got a chance to road test a tool into which it has poured three years of research, nine months of development and thousands of dollars: a Total Quality Management (TQM) initiative.

"An end user in Power Tools had waited until the last minute to generate a report," said Rosina Maiers, director of business information services. "When he went to do it, the graphics package wouldn't work: They had selected package X, and the company standard is package Y." The user's panic, Maiers said, was compounded by his mission: The report was one he was giving to the firm's president the next morning.

Power Tools and Accessories is Black & Decker's largest business unit. That makes it one of corporate IS' key customers. However, Maiers said, the working relationship between the two has traditionally suffered from a communications gap.

"We just didn't speak a common language," Maiers added.

An eleventh-hour software glitch in a Power Tools program is just the kind of incident that would have left people frustrated and snarling — and the software problem very likely unsolved — one year ago, she said.

Not so this year. Under the gun of a business crisis, according to Maiers, "We decided, 'Wait a minute — let's try using the TQM principles.' "

One reason this was an ideal test case for TQM was that the quality program's maxims were familiar to both groups. In early 1990, Power Tools became the first Black & Decker department to go through formal TQM training. Last fall, corporate IS became the second.

Thinking like the customer

In addition, Maiers said, quality training drummed into the members of the department the importance of thinking like the customer, not for the customer.

"We talked to the Power Tools people in their language and common language — not in our language," she said.

Another TQM tenet called into play by the IS people was "No meetings without ground rules." "We set up a meeting with succinct ground rules," Maiers said. "Everyone on time. No personal assassinations. No reprisals."

With procedure clearly outlined and the language barrier vaulted, Maiers said, the dreaded word *meeting* — often a euphemism for "waste of time" — became an efficient exchange of information. The group from Power Tools was able to explain its problem. The group from IS was able to understand and fix it.

Black & Decker IS Vice President Sidney Diamond conceded that the TQM tenets might sound like standard rules from management training courses.

> FIGHTING FOR survival in so unforgiving an environment, companies are jumping at anything that promises relief — even the old chestnuts of quality management.

However, he said, it is only through TQM training that they have been heeded.

TQM skeptics who ask why it has taken U.S. industry until now to embrace so basic a corporate creed pose a valid question, according to Diamond. At least part of the answer, he speculated, is that worldwide economic uncertainty is converging with dramatically increased global competition to put unprecedented pressure on managers.

Fighting for survival in so unforgiving an environment, he said, companies are jumping at anything that promises relief — even the old chestnuts of quality management.

In addition, IS is still a relatively youthful function in the corporate environment, he pointed out. "In a lot of ways, we're the new kids on the block. Some of the mature management attitudes you see elsewhere are just starting to enter into the IS picture."

Black & Decker corporate IS boarded the TQM bandwagon looking for a route to better product yields at justifiable costs — a considerable motivation for any IS department these days (see story at right). Encouraged by the likes of the recent quick fix served up to Power Tools, Diamond said he still believes the quality initiative will lead to just such ends.

But in the short term, Black & Decker's IS department is staying the course largely because the quality effort is providing something else IS departments have long been seeking: insider status within the firms they serve.

"IS has been viewed as something from outer space — not just at Black & Decker, but across the board," Maiers said.

Often written off as nerds by a firm's business elite, she noted, IS insiders have compounded the problem with jargon, acronyms and condescension toward their less technologically sophisticated corporate counterparts. TQM's creation of a common language, she said, is tearing down those traditional walls.

Black & Decker Corp. IS toolbox

Size of department ▶	117 people
Budget ▶	$16 million
Corporate data center ▶	outsourced to Black & Decker subsidiary PRC, Inc. in $20M, five-year deal signed in late June
Approximate number of IS workdays invested in first stage of total quality management training ▶	400 workdays
Approximate investment ▶	$102,400

CW Chart: Doreen St. John

IS survey uncovers cost-saving methods

BY NELL MARGOLIS
CW STAFF

Confronted two years ago with the universal information systems question of how to deliver more and better technology-based aid to the company at a justifiable cost, Sidney Diamond resorted to an age-old information-gathering tactic: Ask around.

In fact, the vice president of IS at Black & Decker Corp. talked with approximately 75 IS directors at multinational companies, including the likes of Pepsico, Inc., Nynex Corp., Pan Am Corp. and Cadbury-Schweppes PLC. He asked which low-cost computing strategies worked — or bombed — for them.

"One answer that came back repeatedly was 'De-emphasize the mainframe,' " Diamond said.

Virtually every one of the IS directors who participated in the survey reported large-scale, ongoing efforts to offload as much computing work as is practical to less-expensive personal computers and workstations.

Increasingly, IS directors are de-emphasizing not only mainframes but hardware altogether, according to many respondents. "Hardware is a commodity; software is where it's at," said Gad J. Selig, vice president of IS at New York-based Nynex. "And one of the cost-saving principles we have consistently preached is, 'Buy it, don't build it.' "

The risks of pushing out computing power and responsibility — lessened security, for instance — are outweighed by patent rewards, said another of the surveyed IS directors, who works at a Fortune 500 company and asked not to be identified.

Not all surveyed executives see giving control to users as a path to IS savings. Centralized processing wherever practical also ranked high on the list of suggested strategies.

Using common systems minimizes duplication and saves money, said Joseph Nash, IS vice president at Stamford, Conn.-based Cadbury Beverages, Inc. "It also has a valuable side benefit: It makes acquisitions and divestitures much easier," he said.

Ironically, Diamond noted, some IS departments can save money by resisting the temptation to dive headlong into a common systems initiative. "The global systems concept has tremendous payoffs — but only if the system can actually be implemented," he pointed out.

As with outsourcing — another popular, if controversial, IS cost-saving alternative — many IS leaders are finding that the most cost-efficient way to go initially is to implement discrete functions or applications on a centralized, global basis while allowing others to remain dispersed, Diamond said.

Buying commercial software is a well-acknowledged money saver; buying it in bulk, the anonymous IS director added, saves still more. However, while "standardizing on a software platform worldwide can save you millions," it also ups the ante on scoping out the most reliable vendors.

The one magic answer that clearly emerged from his research, according to Diamond, "is that there's no magic answer."

Microsoft updates Mac management

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. released a project management package for the Apple Computer, Inc. Macintosh last week. The update removes much of the rigid structure of this type of application but lacks support for many features of Apple's System 7.0 operating system.

Microsoft Project Version 1.1 does not support some of the advanced features of Apple's new System 7.0 operating system, such as Publish and Subscribe.

Senior Vice President Mike Maples explained that when work began on the project management package nine months ago, the feature set of System 7.0 was not firmly established. Microsoft engineers said they will probably release a fully System 7.0-compliant version within a year.

The update's main improvements include several new features designed to break down the rigidity that is characteristic of many project management packages.

Unlike programs with fixed data entry forms, Microsoft Project provides users with a "to do" list that offers a less structured approach to scheduling. Some users may prefer to outline the major phases of the project first and complete the details as the work progresses.

A group link function lets managers highlight a series of related activities and link them all sequentially in a single icon click. A group edit function speeds data entry by allowing users to enter data for a select group of tasks automatically.

Users can also save files in various data formats as well as cut, copy and paste information to other applications by using the clipboard feature.

Data can then be viewed and manipulated in a variety of chart, spreadsheet and table formations.

Microsoft Project for the Macintosh will sell for $695. Large corporate customers can also get a license package for $595.

ADVANCED TECHNOLOGY

TECH TALK

Critical chip channel

■ IBM scientists said they have doubled a critical performance factor for the type of transistors widely used in memory and high-density logic chips. The advance offers the potential for faster computer chips for laptops, personal computers and workstations. The scientists created an experimental transistor known as a p-channel metal oxide semiconductor field effect transistor (Mosfet). The tiny transistor is less than 1 micron wide, a fraction of the width of a human hair. To improve the transistor's performance, the scientists built a silicon-germanium alloy channel under the surface of the Mosfet to prevent the charged particles that carry electrical current from bumping into the surface and scattering.

Super superfloppy sales

■ Sales of 4M-byte superfloppies will soar from $20 million in 1991 to $300 million during the next four years, according to Toshiba Corp., creator of the technology. The market will grow, thanks to news that IBM has decided to introduce personal computers using the 4M-byte drive, Toshiba said. The superfloppy is capable of storing 2.88M bytes of data after it is formatted and will be used heavily in financial services, architecture, engineering and design, health care and graphics, according to Gene Dougherty, director of sales and marketing at the Recording Media Division of Toshiba American Electronic Components, Inc.

Simulations in real time

■ The National Aeronautics and Space Administration's Langley Research Center has installed a Convex Computer Corp. supercomputer to aid in flight simulation research programs. The center's research studies include simulation of aerodynamics, flight control systems, air traffic control and maneuverability of high-performance jet aircraft.

Wherever you go, they will follow

'Active badges' allow computer network to keep silent tabs on employees' whereabouts

BY MARYFRAN JOHNSON
CW STAFF

George Orwell's Big Brother is watching more keenly than ever at the Olivetti Research Laboratory and the computer laboratory at Cambridge University in Cambridge, England. Employees there are sporting experimental infrared tracking devices called "active badges" that allow a computer network to silently keep tabs on each person's whereabouts.

The small clip-on badges hanging from shirt pockets and dangling from belts are equipped with transceivers that emit uniquely coded signals every few seconds.

The signals are picked up by infrared sensors located in each room and transferred to workstations and personal computers that serve as nodes on a distributed computer network.

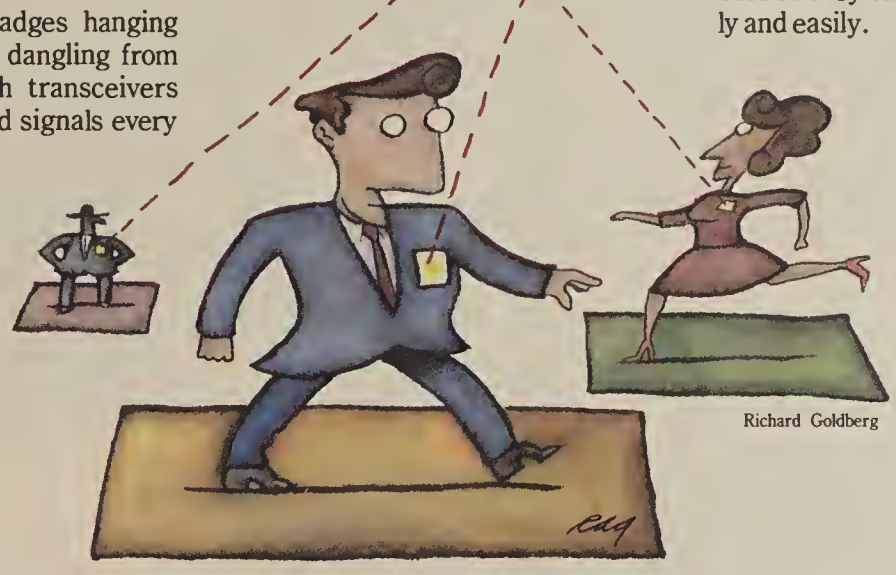
When telephone calls come in to the facility, the receptionist can call up the system, locate the individual and transfer the call to the nearest telephone.

The practical benefits of active badge tracking have turned some initial doubters into believers, said Mark Chopping, a research engineer at the Olivetti lab. "We find we don't miss phone calls anymore," he said. "A lot of the people who refused to wear the badges at first came back after two months and asked for one."

Only the last five "sitings" of each individual are kept track of by the active badge system and then the information is discarded, Chopping added.

The Unix-based software running the active badge program was developed in-house by Olivetti engineers and runs on Sun Microsystems, Inc. workstations at the laboratory.

"This project is another look at the issues around distributed computing and a prime example of advanced applications possible in that environment," said Tom Gannon, director of technology planning and development at Digital Equipment Corp. in Maynard, Mass.



Richard Goldberg

The active badge project is one of several advanced research and development programs under way at the Olivetti lab. Last month, Cambridge-based Olivetti Systems & Networks announced a partnership with DEC for advanced research on the way people use and interact with the next generation of computer technology.

Active badges are also being tested at MIT and at two Xerox Corp. research facilities. There are some 550 sensing stations and 300 active badges in use worldwide now, Chopping estimated.

In addition to enhancing physical security in corporate buildings, this automatic "follow me" telephony can be used to track objects such as luggage — or even children — at airports.

British Airways at Heathrow International Airport has expressed interest in a badge tracking system for child passengers, Chopping said, and some hospitals in Italy are exploring the idea of tagging their emergency staff members so they can be located more quickly and easily.

One of the primary lures of infrared technology for DEC is the potential for connecting peripheral devices to computers and workstations without having to bother with wiring or cables. Another attraction is the notion of automatic identification and log-on for computer users, who could simply sit down in the front of the screen and be instantly on-line.

One potential stumbling block, however, is that "the system responds to the badge, not the individual," Gannon noted. Whoever wears that uniquely coded badge can assume the identity of the proper owner.

Solving the authentication problem is the target of a related Olivetti/DEC research project.

No one has thought much about the cost of installing and dispersing active badges yet, because the system is still in prototype, Gannon said. "Clearly the cost of such a badge would be driven by the marketplace."

Memory cards take weight off notebook PCs

BY MICHAEL ALEXANDER
CW STAFF

Notebook computers are stuffed about as full as the laws of physics will allow. Yet what their manufacturers hope to do is pare off at least another inch in height and three or four more pounds. The solution, they say, may be memory and I/O cards with about the same dimensions as a stack of three credit cards.

"Memory cards will have a major impact on mobile computers within the next couple of years," said John Reimer, chairman of the Personal Computer Memory Card International Association (PCMCIA) and a vice president of marketing at Sun Disk Corp., a memory card maker based in Santa Clara, Calif.

The chief advantages of memory cards are that they are faster, consume 20 times less power and are more rugged than hard disk drives now being used in notebook and laptop computers, Reimer said.

Last August, the PCMCIA and the Japan Electronic Industry Development Association announced a joint standard for memory cards, and in September, is slated to release standards for I/O cards that will pave the way for modems, networking and other devices.

With standards in place, every notebook computer to debut in 1992 and beyond will have at least one slot for a memory card, Reimer predicted.

As many as 20 companies plan to introduce portable computers with card slots at Comdex/Fall '91 in November, Reimer said. Already, Hewlett-Packard Co., Poquet Computer Corp. and Fujitsu Ltd. are marketing lightweight portables using one or more memory cards.

The data storage technology of choice for memory cards is called Flash random-access memory, a chip storage technology similar to electrically erasable programmable read-only memories. Memory cards using Flash technology, which was developed by Intel Corp., do not need battery backup and can be reprogrammed electrically.

Sun Disk sells to OEMs disk drives on Flash memory cards with 2M-, 5M- and 10M-byte storage capacities. The prime drawbacks are that the cards lack storage capacity and are more expensive — up to $100 more per megabyte — than hard disk drives.

Open systems.

Everyone agrees they're

No one's debating whether open systems are a good idea, but you'll hear plenty of discussion about what open systems *are*.

Some insist, for example, that an open system is a UNIX® system. But to others it's whatever it takes to get their different operating systems, networking protocols and databases working as one, and the sooner the better.

That's why IBM views open systems so openly. To us, they begin less with particular technologies and more with the needs of your business.

The real goal is to liberate information that's trapped around your company, so more of your people can use it more easily, and to open commu-

good, but not everyone agrees how to get there.

nications with customers and suppliers, who no doubt planned their systems without thinking about yours.

And of course, you need to accomplish all this without scrapping your existing multivendor investments.

So the paths to open systems will vary, but there's one thing that won't—consistent industry standards. IBM is fully committed to open systems, so we're equally fervent about standards.

We're active on over 1,200 standards initiatives. We're a sponsor of OSF,® a member of X/OPEN,™ and we support ISO,™ ANSI® and IEEE,™ to name a few. And when a new standard holds promise, we support its development.

What's more, we offer AIX™ for UNIX users and we are improving our SAA™ and AIX systems to work more openly with each other and your non-IBM systems. So as you move to open systems, your investments will be protected. We can also help you open your system with consulting services and technical support.

At IBM, we now measure everything we do—from the desktop on up—against a yardstick of openness. It's what we have to do because it's what you want to do. To get more information, call us at 1 800 IBM-CALL.

IBM®

© 1991 IBM Corp. AIX and SAA are trademarks of IBM Corp. The following are trademarks of: Unix Systems Laboratories, Inc., Open Software Foundation, Inc., X/OPEN Company, Ltd., The International Organization for Standardization, American National Standards Institute, Inc.

EDITORIAL

dBuyout

Borland's proposed swallowing of Ashton-Tate is a fitting act of chutzpah for a company that has made audacity a corporate trademark. If the acquisition of its onetime nemesis goes through, Borland will become the clear No. 3 player in the PC software industry and the overwhelming market share leader in desktop database management. Perhaps more importantly, it will thrust Borland into the spotlight, where its unique brand of technical virtuosity, outspokenness and pugnacious energy can't be ignored.

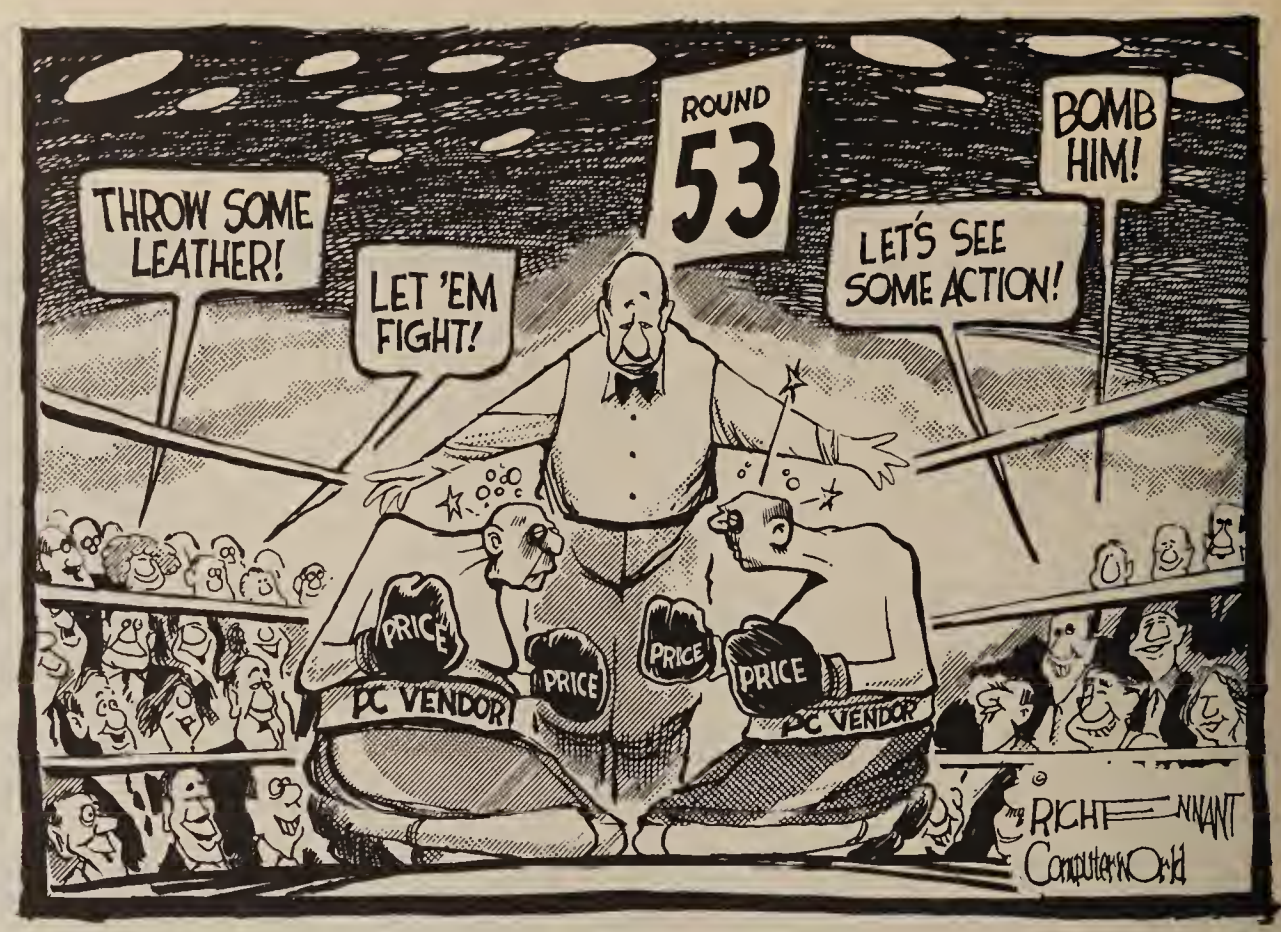
Borland's rise has been as unconventional as it has been rapid. When Ashton-Tate was already king of the database hill, Borland was still selling $99 language products by mail. When the conventional wisdom was that you couldn't strike gold in software without a megahit product and retail support, Borland was producing modestly successful niche software sold by direct mail.

Meanwhile, it was being a thorn in the side of competitors who wanted to keep software prices high and margins fat. Borland used price as a competitive tool from the beginning. It practically invented the sub-$100 software market with Turbo Pascal in 1984 and used cheap upgrades to woo Lotus and Ashton-Tate customers. Competitors have dismissed the pricing tactics as grandstanding, but it's hard to argue with the market share figures Quattro Pro and Paradox have amassed. Its competitors are nervous.

In the driver's seat is Philippe Kahn, the charismatic, moody chief executive who evokes both adulation and scorn. At his best, Kahn is a lightning rod for ingenuity, a visionary and a lot of fun. At his worst, he can be vindictive enough to have once taken a magazine article critical of a competing CEO and distributing it anonymously to a group of that executive's peers.

Borland image consultants have tried at various times either to promote or to muzzle Kahn, depending on how buttoned-down an image they want to portray. The muzzle doesn't work. Outrageous as he sometimes is, Kahn's style is inseparable from Borland's. And he has a knack for attracting smart and capable people to work for him. Borland has managed to produce products that are better than the industry leaders' at a much lower price. Its sales-per-employee ratio is exemplary. It is sometimes guilty of arrogance, but its track record is pretty darned good.

Now, Borland takes on its biggest job yet — absorbing a company nearly as big as itself (and with many more employees) and mollifying a customer base that will be justifiably nervous about the future. To its credit, Borland was direct about its intentions in the hours immediately following the announcement of the deal last week: It is driving the boat. It doesn't see much of a future for Dbase, and Ashton-Tate executives will have little to say about what Borland decides to do. This deal isn't likely to be scuttled by the kind of factional bickering that killed the Lotus/Novell merger last year. And if Borland can pull it off, it will earn the respect that competitors have long been unwilling to grant it.



LETTERS TO THE EDITOR

Open the Windows

Congratulations to Charles P. Lecht for his insight and *Computerworld* for its boldness in exposing the decade's biggest nonissue in the article "OS/2 and Windows: The war that isn't" [CW, June 3].

OS/2 is a full-function operating system that delivers the horsepower required by today's more capable desktop systems. Windows is a graphical user interface that delivers ease of use but fails to overcome some of the serious limitations of DOS. OS/2 is for today — and with the advent of Release 2.0, a serious contender for tomorrow. Windows is for today, but it faces some large technical hurdles in adapting to tomorrow's enterprise computing models.

Of course, as Lecht points out, Windows can be an effective bridge — but in order to cross it, microcomputer managers will want their applications to make the trek as well. What are the major software vendors' plans? Who's supporting both and why? Now that you have exposed the hype, perhaps you can begin to explore issues such as this — and provide greater insight on the real issues organizations face in developing their long-term desktop strategies.

Barrett R. Joyner
SAS Institute, Inc.
Cary, N.C.

Weak argument

Your editorial "Rights to privacy?" [CW, June 3] is so replete with epistemic switchbacks as to be indecipherable.

Although I cannot fault your implied claim that personal information about an individual — even his telephone number, if he happens to have chosen to keep it unlisted — is his private property and should not be made public without his consent, what does that notion have do with automatic telephone number identification?

Are you claiming that the right to private property implies some kind of "right" of the purveyors of what you call "postal pollution" to remain anonymous to their intended victims?

Fraud is not predicated on ownership of a 900 number, and telephone companies can hardly be held accountable for unscrupulous business practices on the part of other businesses.

Further, although you admit that government control of such technologies as automatic number identification and 900 numbers is not "necessarily" a good idea, could you make your claim about keeping the government out of the marketplace any weaker than you did?

Perhaps something like "It *may* not be the *best* idea to turn *every* detail of the operation of *every* corporation over to the government *immediately*" would be a sufficiently irresolute statement of what I gather to be your position to satisfy your apparent need for vacillation.

C. W. Kriel
The Boeing Co.
Wichita, Kan.

Let the user decide

As a developer of custom databases using Advanced Revelation, I read with interest the brief comparison of relational database management systems (RDBMS) in "Comparisons of six multiuser RDBMSs" [CW, June 3]. How the author reached her conclusions is not clear.

Of Advanced Revelation, the author writes that it was "born to help developers create sophisticated transaction-processing applications . . . [it] adds a full set of interactive tools to its programming language and . . . [it offers] maximum programming flexibility."

Of Paradox, she points out that it does not allow "long text fields" and that its use on a local-area network would be less than robust because of its "troublesome network data entry."

Of Foxpro, she points out that the forms generator is nonrelational and that because it lacks QBE and has a Dbase file format, it would be "less useful for ad hoc data manipulation."

Of Dataease and R:Base, she points out that they both lack a debugger.

Yet the author's conclusions don't seem to follow from the factual descriptions. Advanced Revelation is rated only "fair." Paradox is "your best buy." Foxpro is "superb." Your readers would do well to draw their own conclusions based on their specific needs. And I would hope that *Computerworld* could give programmable multiuser network databases fuller treatment in the near future.

Timothy Romano
AIMS Data Systems
Swarthmore, Pa.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

Reading between IBM's lines

The strategy behind the name 'Enterprise System' begins to take shape

SAM ALBERT

When IBM starts whispering loudly in the ears of industry reporters, consultants and IBM-watchers, you can bet it is trying to prepare the marketplace for something — a new or enhanced product line, a new set of services or a new strategy.

Because IBM won't "speculate" about specific unannounced products, its executives often speak in philosophical terms. But if you interpret what they say correctly, you can pretty much predict the future as IBM sees it and intends to build it.

Just about a year ago, IBM began whispering the words "enterprise computing" and speaking philosophically about the importance of so-called "enablers" such as enterprise data, networking, systems management, security, client/server, transaction processing, technical computing and applications development.

That in itself was a good sign because IBM didn't invent the enablers all by itself. These were requirements that the customer community had been raising its collective voice about. It seemed IBM had actually listened.

Until recently, though, it wasn't really clear how serious IBM was about empowering the enterprise. Now the company is talking again, and the signals are there for those who want to listen.

Steady stream

First, despite the recession, the stream of follow-on hardware and software introductions to the big System/390 announcement shows no signs of slackening. As if to underscore its determination, IBM brought forth the Model 860, new 9370 upgrade paths, some needed continuous availability and fault-tolerant capabilities, new security software and cooperative processing options linking System/370 and AIX Personal System/2 applications.

Down the road — probably within the next two or three quarters — we can expect IBM to expand the Enterprise System/9000 processor line further, with bigger, faster machines.

We also detect a strong intention to use this robust new architecture to create new, specialized engines for special solutions. Likely possibilities include a transaction processor and data managers of two types: one that can support a wide variety of different disciplines within an enterprise and one that can provide centralized management of local and remote systems.

IBM can be expected to build on the largest base of vector facility users in the world. Enhancements to Escon, Sysplex, parallelism and other systems management goodies will continue to be built on the Systemview platform, with due deference to open systems and open networking. The number of Systemview applications available should grow by leaps and bounds once IBM unveils its plan to bring software suppliers into Systemview.

AD/Cycle and client/server areas haven't seemed to be moving forward as rapidly as IBM and some of its customers would like, but it's clear that the company is determined to overcome the obstacles and lead the way in distributed data.

The latest round of chatter from IBM follows a recent precedent, in that there is little stress placed on hardware. Obviously, it would like to install as much IBM hardware as possible. But it's clear that the company has come to the conclusion that technology by itself isn't enough for the future. Function, applications and services have to be welded into the offering.

Keeping promises

Can IBM deliver on all of these promises? Can it change some of its stripes and make its marketing force think solutions instead of boxes? Will the customers believe that IBM can and will pull it all together?

There's a long way to go in implementing this new strategy, but IBM seems to be doing pretty well so far. More than 75% of the 90 software products IBM announced Sept. 5 have been delivered, including such swingers as MVA/ESA, VM/ESA, VM/ESA 4 and Netview Version 2. And 14 of the 18 ES/9000 processors have been delivered. The remaining ones are said to be on schedule.

Another indication of IBM's commitment to the enterprise strategy is its new emphasis on and investment in customized applications.

The man who headed up the "big iron" division that brought out the ES/9000 processors, Vice President M. Bernard Puckett, now heads the relatively new Application Solutions line of business, which has more than 20,000 people, including an army of industry experts.

IBM has even brought aboard former Booz, Allen & Hamilton, Inc. executive Robert Howe to add basic strategic consulting to its offerings.

Even though customers were the inspiration for this tack, IBM will have a tough educational sell on its hands. Not all customers are going to be thrilled with the changes.

Some senior business executives are gun-shy. They feel they haven't gotten their money's worth from their current IS investments and won't welcome the idea of trying to change fundamental processes — something that enterprise computing often demands — in the middle of a tough economy. Others have the vision but seem willing to wait until all the pieces are "in place." IBM will have to convince them that they don't need to wait but that just about everything in this industry evolves, and their organizations can, too.

Albert is president of Sam Albert Associates, a consulting firm in Scarsdale, N.Y., and chairman of Firstgroup, a technology publishing company.

Get off the wagon train while you have a chance

L. PAUL OUELLETTE

What do wagon-train masters, village blacksmiths, riverboat captains and the Maytag repairman have in common?

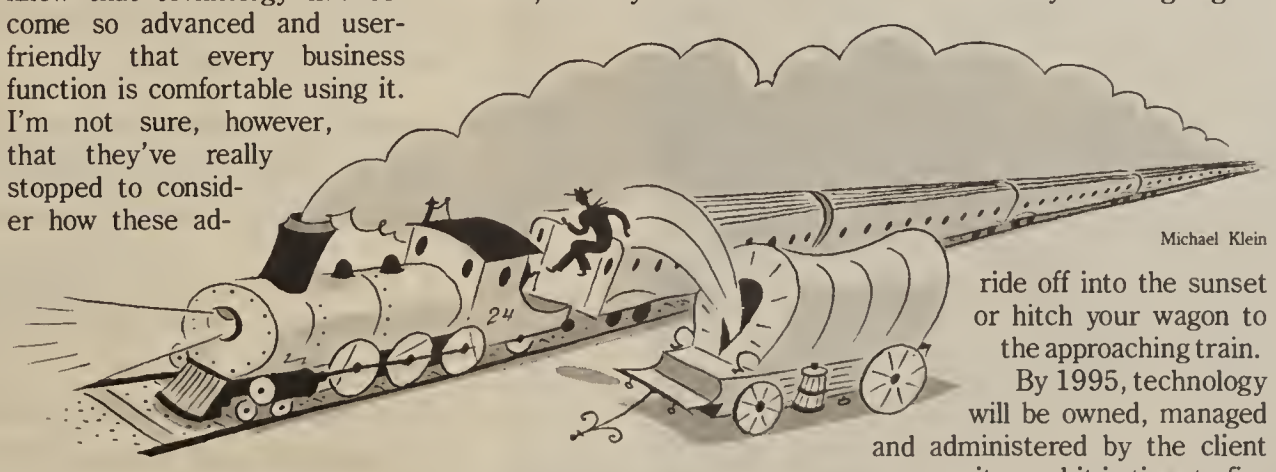
You guessed it — the world has passed them by, as technological and cultural changes have made their jobs obsolete.

The question is, will information systems professionals soon be joining them? I think the answer is yes, although, unlike some of the other professions named, IS professionals have a chance to find new roles.

It shouldn't come as a surprise that the progress of IS would eventually come to affect the IS function. Think for just a minute about how many business functions have been altered or made obsolete by IS in the last decade alone. If you concentrate hard, you may be able to remember a time when the credit manager would receive and review every incoming check or when vital orders were prepared by an army of typists.

This is not a nostalgia trip. My point is that things change very rapidly, and until now, IS has been the leader and instigator in technological and professional changes affecting the business community. Now, however, I think it may be the IS industry's turn.

Of course, IS professionals know that technology has become so advanced and user-friendly that every business function is comfortable using it. I'm not sure, however, that they've really stopped to consider how these advances are likely to affect the IS role or asked themselves where they fit in now that the domain that was once exclusively theirs has become communal property.



Michael Klein

Think again of the saga of the wagon-train master. His value was in his knowledge of the route westward and his leadership ability in moving thousands of people across strange and dangerous terrain.

Then think of how the wagon-train master must have felt when the railroad came along to make the trip west so much faster, simpler and safer. Comparatively few people knew or cared how the railroad engine worked, but everybody knew that it was a much more preferable mode of travel and quickly figured out how to read a timetable.

His role had changed, but what about himself? My guess is that if he did not fight progress and learned something about the railroad, he likely survived.

IS professionals have all traveled a similar route. They remember what it's like to be the ones with all of the technical knowledge and who know exactly what to do. But then came PCs, technological simplification and computerization at the departmental level, and things started to get fuzzy. Suddenly, there were more people involved with IS and more people outside of IS making systems decisions.

Now things have reached a stage where IS professionals are in danger of being excluded altogether.

When a company can process a full-blown, 10,000-employee payroll system with a cluster of integrated PCs, when "downsizing," "rightsizing" and "outsourcing" stop being buzzwords that you read about and become apt descriptions of the way your company operates, it is time to heed the whistle and figure out whether you are going to ride off into the sunset or hitch your wagon to the approaching train.

By 1995, technology will be owned, managed and administered by the client community, and it is time to figure out how to fit into that new reality.

There will always be a need for people with technical expertise to help address the systems and to do applications design for specific needs, but the large programming staff as it is known today will be gone.

At the corporate level, IS professionals will see a core group for technological strategy planning and management of issues such as security, database administration, telecommunications, corporate data administration, data integrity management and futuristic planning for technology. There will be a few people scattered around in the various on-line departments fulfilling specific applications needs at the local level.

But where does that leave those of us in the IS profession?

To a large extent, that depends on our response. There is a place for IS in keeping technology interconnected and operating effectively. Clients won't want that role.

That job is only available, however, if IS professionals learn about the new machinery that has changed our world. That means knowing our companies. The best way to accomplish this is by opening up to our business peers, especially those in sales and marketing.

This will not only teach us the ins and outs of the business, but it will give us a leg up on other skills such as consulting, communicating, marketing and negotiating, which are critical if IS is going to make the transition into the next era of computing.

Ouellette is chief executive officer and founder of Ouellette & Associates Consulting, Inc., a management consulting and training firm in Bedford, N.H. He is a longtime member of the IS profession.

"Computerworld is an excellent way to keep informed at a high level...without investing too much time."

Larry Bacon
Senior Vice President
The Travelers Companies

"We issued our first policy by computer in 1957...and we've been expanding and upgrading our computer technology ever since.

"Our challenge here at The Travelers is to continually improve the quality of our products and services by applying technology to everything we do...from mainframes and databases to our data and voice networks, LANs, PCs, and telephones.

"To do that our data processing people need to be true professionals. We need to understand what's going on in the broad spectrum.

"One of the ways I stay in touch is by reading *Computerworld*. It covers, in a fairly brief format, the full range of technologies — communications, PCs, hosts, languages, and development tools. It doesn't just focus on one aspect of the industry.

"The format is crisp and the style isn't wordy...and that's good. Because I don't always have the time to read long, in-depth articles. But I do take the time to scan the relatively short summaries in *Computerworld*. Then, if I want more information, I can read the whole article or do some further research.

"Of course, if you're going to be on top of the industry, you need to know what's happening while it's happening. And routing slips just don't get the job done. I can't remember the last time I saw a routing slip on a periodical at The Travelers. By the time you get the magazine, it's old news.

"So if your profession involves knowing where technology is going, then *Computerworld* is one of the tools that can help you stay current."

If you'd like to get the latest breaking news in the IS industry, order your own copy of Computerworld *today. You'll receive 51 information-packed issues. Plus you'll get our special bonus publication* The Premier 100, *an annual profile of the top companies using information systems technology. Just use the postage-paid subscription card bound into this issue. Why wait?*

COMPUTERWORLD

The Newsweekly of Information Systems Management

More Up-to-the-Minute News!

51 Issues for ~~$48~~ NOW ONLY $38.95

Yes, I want more. I accept your offer of $38.95 for 51 weekly issues.
That's a savings of over $9.00 off the basic subscription rate.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $58.97, Central/South America $130, Europe $195, all other countries $295.
Foreign orders must be prepaid in U.S. dollars.

COMPUTERWORLD

IS sites hear rumble of war

Officevision on hot seat as SAA boss takes over

Windows role to grow

Morris case impact slight

VDT monitoring under stress

INSIDE

Please complete the information below to qualify for this special rate.

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgmt; Dir./Mgr PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
80. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4128-1

Recyclable Paper

More Integration Strategies!

51 Issues for ~~$48~~ NOW ONLY $38.95

Yes, I want more. I accept your offer of $38.95 for 51 weekly issues.
That's a savings of over $9.00 off the basic subscription rate.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $58.97, Central/South America $130, Europe $195, all other countries $295.
Foreign orders must be prepaid in U.S. dollars.

COMPUTERWORLD

Novell lining up links to outside world

Microsoft, IBM diverge on OS/2 direction

DEC faces rocky road in service shift

CA users fume over new fees

INSIDE

Please complete the information below to qualify for this special rate.

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgmt; Dir./Mgr PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4128-1

Recyclable Paper

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

COMMENTARY

Mitch Betts

Beware of the Error Zone

You're about to take a journey into another dimension, where there's no sight, no sound, just the on-and-off pulses of machine computations. It's a place in the darkest recesses of computer science, where the printouts from engineering and financial calculations — which we accept as perfectly accurate — are not what they seem.

Welcome to the Computer Error Zone.

Our first stop is San Diego, where auditor Bernard Lomax has been working on a vexing problem for five years. It appears that as many as one-third of the nation's adjustable-rate mortgages (ARM) have been miscalculated by computer systems.

There are 4,000 different types of ARMs and nine different ways that the fluctuating interest rates can be rounded off, explains Lomax, the chief executive officer of Bennington Financial Group Ltd. For example, the interest rate can be rounded off to the nearest eighth of 1%, rounded up to the next eighth of 1% or rounded down to the last eighth of 1%.

The miscalculations occur when a portfolio of ARM loans that are supposed to be calculated and rounded one way are sold to the secondary market, where a service bureau plugs the numbers into a formula that calculates them a different way, Lomax says.

Continued on page 30

PC forces drive minis upscale

BY SALLY CUSACK
CW STAFF

Industry analysts are saying that midrange computing is coming under the same type of price/performance pressure that has driven the personal computing market.

Simultaneously, micro-based technology and very large-scale integration, which made the personal computer possible, are now moving into midrange systems and servers.

According to Myron Kerstetter, vice president of the Midrange Computing Strategies group at Gartner Group, Inc., this results in a shrinking price gap between PCs and servers, while enhancements such as symmetrical multiprocessing and high-end I/O subsystems are increasing the performance gap between the two technologies.

Downsizing alternative

Perhaps more important to vendors, Kerstetter noted, is that the price gap between midrange and mainframe computers is widening dramatically while the performance gap is shrinking. "What has happened is that while the midrange does feel pressure from the desktop at the low end, it is moving easily into mainframe-level processing and becoming a serious alternative for downsizing," Kerstetter said.

Gartner Group said that next-generation information systems architecture will consist of a master platform technology that is peer-to-peer and based on client/server computing with relational database and object-oriented capabilities. User productivity will be optimized with workstations, not a mainframe, at the heart of activities.

Kerstetter said open systems involves much more than a Unix license — in fact, Unix is not necessarily open.

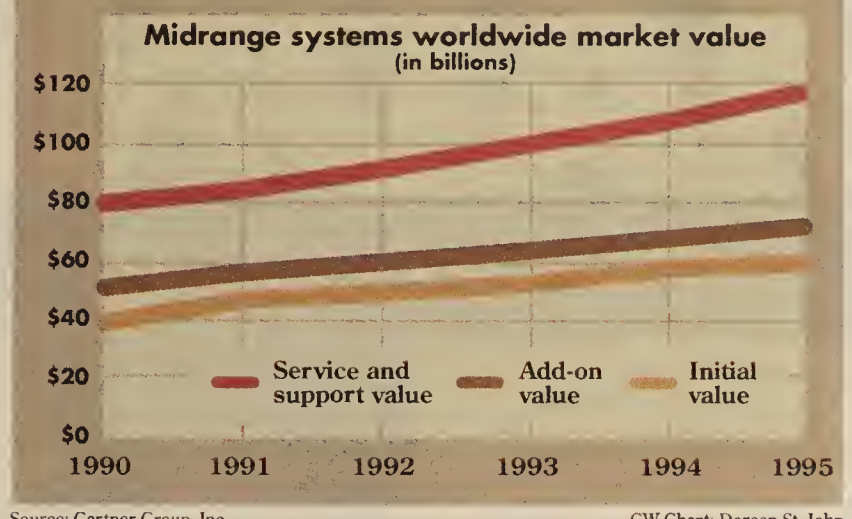
Unix involves a large number of issues, he said, ranging from interconnectivity to accommodation of legacy systems. Gartner Group defines legacy systems as existing hardware and/or software installed at a user site.

Kerstetter said the open systems movement is evolving at three ascending levels:

- The technical level of interfaces to system facilities, where a set of application programming interfaces (API) — such as X protocols for communications, Posix and XPG for graphics — are open and becoming standards.
- Gartner Group expects a high degree of standardization to evolve at the master information technology level during the next five years, and the master information technology platform facilities that ride above the APIs and define the enterprise information management environment.
- The customized add-on facilities designed to ride on top of the master information platform. These value-added functions, such as service and systems integration, will be the last opportunity for vendor differentiation and competition.

More support

Service and support will represent a larger chunk of the midrange market's value by mid-decade



Source: Gartner Group, Inc.

CW Chart: Doreen St. John

IBM reveals date for IMS/ESA 3.2 shipment

BY ROSEMARY HAMILTON
CW STAFF

IBM will begin shipping the next release of IMS in November 1992, more than two years after it was first announced.

The introduction of IMS/ESA Version 3 Release 2 was part of the System/390 product blitz in late 1990. At that time, IBM said it would provide an availability date for the new release of this mainframe database in June of this year.

A company spokesman who provided this shipment date also said that four other System/390 software products scheduled for availability last month were released on time. This includes CICS/ ESA Version 3 Release 2, SAA Asset Manager/MVS, SAA Delivery Manager/MVS and SAA Delivery Manager/VM.

Some observers questioned the two-year wait between the IMS introduction and availability, but at least one user said the timing should not be a problem.

"It should work out pretty well," said Doug Underhill, a vice president at CSX Corp. "It will give us the opportunity to use all the new features of 3.1."

New architecture

The current release marked a major architectural change for IMS by separating the database access and the data communications components of the database management system. One analyst said IBM is likely continuing this work with Version 3.2 and speculated that this may explain the release date.

"This is the later stages of IBM breaking apart the database and data communications parts of the product," said Paul Hessinger, chief technology officer at Computer Task Group. "This is a significant degree of complexity."

Hessinger also said the availability date is "stretching it."

"I think 18 months would be understandable, but two years is a bit longer than is really acceptable."

The IBM spokesman said the availability date is not unusual and said users "won't have to wait that much more than for prior releases."

NAPERSOFT

NAPERSOFT, Inc.
One Energy Center
Naperville, IL 60563-8466
708/420-1515

Treats Customers Write

NAPERSOFT® Automated Correspondence Software handles your written communications to customers quickly, accurately and professionally with:

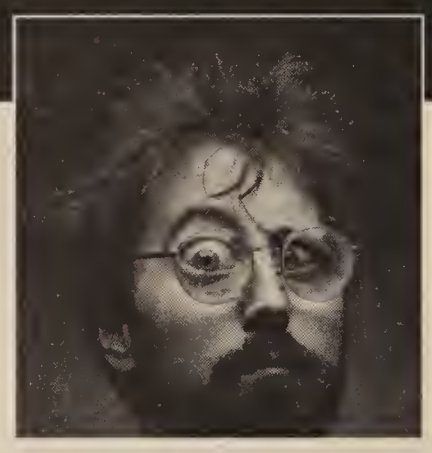
- On-line or batch letter writing
- On-line letter history
- On-line notepads
- Full function word processor
- Spell checker
- Full printer support

With your IBM mainframe and NAPERSOFT software you can streamline your customers correspondence! NAPERSOFT... for businesses that treat customers write.

FIRST CLASS SERVICE

Introducing ForeSight™

THE METHOD TO THE MADNESS.



Put ForeSight in your CASE and lighten your load.

If you're using CASE tools to tame that certain madness known as systems development, then you know another kind of madness. Trying to efficiently manage all the IS design projects that come through your department. Chances are your various project leaders have their own ideas about methodology, which may or may not mesh with your organization's goals. Or with its written methodology–if there *is* one.

Unlock the power in your CASE tools, with ForeSight.

You need a systems development methodology housed in a CASE tool. One based on information engineering principles, giving you a built-in standard for applying the powerful IE capabilities of CASE. A product of practical experience, not theory. Customizable. And easy to use. Something unlike anything that's been available before.

ForeSight: the revolutionary solution, available today.

ForeSight is the industry's only CASE-resident systems development methodology. It's comprehensive and versatile, allowing you to develop unique project paths firmly rooted in an IE baseline. And, using a CASE tool, it can be customized to suit your organization–or specific project. What's more, you can overlay your current methodology atop ForeSight to get CASE in gear–fast.

ForeSight: better than the rest.

Until now, the only systems development methodology you could get was available in voluminous books. Or encyclopedias-on-disk. Never has there been a CASE-resident, interactive methodology–until ForeSight.

ForeSight's methodology has been forged from years of practical field experience in IE and consulting. It's a valuable IE reference tool in itself, supported by complete training and professional services. And it's a lot less expensive than those hard to use, impractical books and disks. In fact, you can buy ForeSight for just $12,500 per copy. Or you can purchase a very reasonably priced site license.

ForeSight: a project manager's best friend.

ForeSight simplifies project management. It provides a standard process against which to measure and manage the project, linking ForeSight's methodology to project management tools. And improving the effectiveness of your IS department.

It's time to find out more about ForeSight.

There are so many benefits to using ForeSight...but we're running out of space. To learn more, write, call, or fax us and ask for our ForeSight brochure. We'll be happy to show you how ForeSight's methodology can tame the madness of systems development for your company.

Call 1-313-569-8843 today.
Or go mad.

ForeSight™

The CASE-resident systems development methodology™

ceo

Computer & Engineering Consultants, Ltd. 18620 West Ten Mile Road, Southfield, Michigan 48075-2667 Phone: (313) 569-8843 Fax: (313) 569-4089
In Europe: 7 Tanners Yard, Bagshot, Surrey GU19 5HD, U.K. Phone: 0276 51414 Fax: 0276 51660

Service delivers painless insurance claims

BY MARYFRAN JOHNSON
CW STAFF

PRINCETON, N.J. — With the quick swipe of a magnetized card through a special processor, thousands of doctors around the country are dispelling the tedium of insurance company paperwork through Health Link.

This electronic eligibility and claims processing service, created and sold by Health Information Technologies, Inc., based here, is in use today by health providers and clients of Prudential Insurance Co., Travelers Insurance Co., Aetna Health Plans of New Jersey and Keystone East HMO, a Philadelphia-based Blue Cross/Blue Shield health maintenance organization.

Anchored by a fault-tolerant XA2000 Model 220 computer from Stratus Computer, Inc., the Health Link service has made the process of filing insurance claims as paperless and speedy as using a credit card to buy a new suit and tie.

"The doctors find the biggest benefit is their ability to check member eligibility at point of service and then electronically send in the claim," said Barbara Abrams, administrator of special projects at Aetna Health Plans of New Jersey, which has 800 terminals in doctors' offices statewide.

Health Technologies' Morlino *talked to large insurers about their needs*

If a patient discovers that his health plan does not cover that office visit, the Health Link terminal automatically dials Aetna's customer service number for immediate help, Abrams said.

Through electronic claims submission, Aetna has found that up to 65% of the forms submitted to the New Jersey regional office are "clean claims," requiring no human intervention, she noted.

While other claims checking services do exist, Health Link appears to be the only one using point-of-sale terminals rather than personal computer-based networks, company officials said. Among the four health plans now using the service, 75,000 transactions per month are flowing into the Stratus machine.

Health Technologies has a second Stratus XA2000 Model 220 being set up as a disaster recovery machine and a Model 70 in use for applications development.

"When we decided to build Health Link, we talked with the large insurers to understand their needs for such a system. The leading problem they indicated was system unavailability and response time from PC-based systems," said Joseph Morlino, senior vice president of systems and technologies at Health Technologies.

Old systems a problem

A formidable obstacle to the insurance companies setting up this kind of service themselves is the age of their systems and their inability to handle remotely entered transactions. "One of the advantages of the Stratus is that it's good at intercomputer transactions," Morlino said. His firm uses network communications software from Software Development and Maintenance International, Inc. in Fuquay-Varina, N.C.

The physicians' offices connect to the Stratus system at Health Technologies headquarters via dial-up 800 number access nationally and through a packet-switched BT Tymnet, Inc. network locally, Morlino said.

The terminals also have some intelligence programmed in. A small display screen on the terminal will ask the doctor several questions the insurer needs answered on the claims submission form. The doctor can also log in referrals to other physicians in the health plan.

"We can remotely change that programming from the Stratus, so if an insurer wants to ask different questions, they can," Morlino noted.

Costs cut in half

With its first systems installed two years ago, Health Link cuts claims processing costs by up to 50% and processing time by two-thirds, Morlino said.

Physicians who feel beset by the increasing numbers and complexities of insurance payment plans are also relieved by the notion of one harmless-looking terminal that handles a variety of insurers, according to Morlino.

The company's primary terminal supplier is Verifone, Inc., a widely used point-of-sale credit-card authorization terminal. "It's a fairly sophisticated microprocessor in its own right, but it's not intimidating," Morlino explained. "There is no separate monitor, and we find that's advantageous with doctors because it doesn't look like a computer."

Health Technologies was founded in 1985 on the notion that "smart card" technology was going to take off in the health-care business, alongside Visa and Mastercard. But when the banks lost interest in the fairly expensive technology — running $8 to $15 per smart card — Morlino said his firm refocused its efforts on the far cheaper technology of magnetic-stripped cards.

"We could provide the same services, but we lost that ability to carry the information around on the card," he said. "So every transaction necessitated a credit-card authorization call to a central computer."

The company initially figured on becoming a "regional player, like a bank credit-card processor," Morlino added. "But all that changed when we signed national contracts with Travelers, Prudential and Aetna to deploy terminals nationwide."

PHYSICIANS BESET BY the increasing numbers and complexities of insurance payment plans are also relieved by the notion of one harmless-looking terminal handling a variety of insurers.

Methodology is CASE tool-friendly

Foresight software guides users through CASE development process

BY PAUL GILLIN
CW STAFF

SOUTHFIELD, Mich. — In the systems development field, it is sometimes said that methodologies may be expensive, but they sure look good sitting on a shelf.

Methodology proponents admitted that few big users have successfully adopted grand systems development schemes because the techniques available are too complex and overwhelming to follow. With that in mind, a systems development consulting firm here has introduced a methodology that can be built into existing computer-aided software engineering (CASE) tools and followed as the user builds the system.

Foresight, the first software product from Computer & Engineering Consultants Ltd., uses a methodology based on the Information Engineering approach that is embedded into a host CASE system and guides the user through diagrams, hypertext and on-line Help.

Foresight is available initially under Knowledgeware, Inc.'s Application Development Workbench and Information Engineering Workbench. It will be ported to Texas Instruments, Inc.'s Information Engineering Facility by the end of the year, according to Samuel B. Holcman, president of Computer & Engineering Consultants.

Customized by the user

Foresight's methodology is embedded into the CASE tools in the form of diagrams, menu trees and text that are intended to be customized by the user organization, Holcman said. He called flexibility key, recalling that a Ford Motor Co. study of 11 methodology users at other firms found that "each had customized its methodology so much within the first 24 months of adopting it that it wasn't recognizable."

By embedding the methodology within the CASE tool, Foresight gives users added incentive to adopt structured development, said Al Case, program director of software engineering strategies at Gartner Group, Inc. "This becomes a helpful adjunct to the tool rather than something to satisfy the auditors," he said. CASE vendors have tried linking development systems with a methodology before, but the results have usually been "tack-ons where you jump between the tool and the methodology," Case said. "This is a structured system that is embedded right in the tool itself."

Foresight costs $12,500 for a single license. Site licenses are also available.

$22/HR For CICS, IMS, DB2, COBOL & PC Application Systems Development

. Fixed Price or T&M Basis
. On-Site System Design/Implementation
. Free Cost/Time Estimates
. Off-Site Program Construction

Call Mr. Cary Schorr, Marketing Director. Toll Free 1-800-328-6755 PDT

CCD ONLINE CCD Online Systems, Inc.

Midas gets Maurer's touch with systems upgrade

BY ELLIS BOOKER
CW STAFF

CHICAGO — Midas International Corp. was on the verge of replacing its 14-year-old Datapoint minicomputer-based order processing system with an IBM 3090-class mainframe when Bill Maurer began interviewing for the job of vice president of information systems in mid-1989.

Hearing about the plan, Maurer, who at the time was the director of systems development at Walgreen Co. in Deerfield, Ill., proposed an alternative: an architecture based on IBM's midrange Application System/400.

New tools

In addition, Maurer advocated the use of commercial software to replace the company's suite of homegrown applications and a computer-aided software engineering (CASE) tool to make the migration to the new platform easier.

"I told them we could purchase multiple midrange machines, less complicated software and move resources to applications development," recalled Maurer, whose suggestions won him the IS vice president job.

The major reason for shying away from a new mainframe, Maurer said, was that Midas' IS staff then — as now — was just around 40 people.

"The issue was how to digest a new mainframe operating system, new hardware, new applications and conduct end-user training," he said.

Experience speaks

When Maurer advocated the AS/400, he was speaking from experience.

At Walgreen, he was in charge of one of two groups completing the installation of a substantial number of the IBM midrange systems. Maurer handled systems development for the corporate headquarters and the distribution; a second director managed the retail locations.

Currently, Midas has two 370-type hosts (a 4381 and a 4341), both running DOS/VSE for financial and corporate logistics applications: a Series 1 and a System/36 for its two-plant manufacturing operation.

Lauren Brill

Midas' Maurer *and order processing supervisor Stephanie Annerino champion IBM AS/400*

Spread among its nine warehouses around the country are two AS/400 B45s and seven B35s. These units, which replace the Datapoints in the warehouses, are linked back to a corporate AS/400 B50 over the IBM Information Network.

Currently, all of the Datapoints have been replaced with AS/400s, as has the Series 1. In total, Midas has 10 AS/400s today.

But Maurer, who added two employees with AS/400 experience last year, also needed a CASE tool.

After an evaluation of CASE products begun in November 1989, Midas turned to AS/SET from System Software Associates, Inc. (SSA). Midas also uses BPCS, a line of distribution, inventory management and order-processing packages, and AS/NET, a language for networked AS/400s, also from SSA.

At Walgreen, Maurer had used another CASE tool but picked SSA's product this time mostly because Chicago-based SSA promised him strong support.

Deployed last February, AS/SET has helped build three applications to date, including a dealer inventory return program that took just a little more than one month to develop.

Maurer said he also looks forward to working on a soon-to-be-released workstation-based front end to AS/SET.

However, he is realistic about what CASE can do.

"I'd say we can develop three to four times faster . . . but no way do I believe you get an eight to 10 times increase," Maurer said.

IS in demand

Midas, with $450 million in annual revenue, has two manufacturing plants, nine distribution centers and 116 company-owned retail outlets.

However, Maurer explained, Midas is mostly a distribution company, sending inventory out to its 1,600 franchisees nationwide.

The next generation of these end users — the sons and daughters of Midas' original franchisees, now in their 60s —will increasingly demand more of Midas in the way of IS, Maurer predicted.

Now Leap Platforms In a Single Bound.

Now your dBASE® applications can be quickly and easily ported to UNIX platforms—without reprogramming or data conversion.

dBASE IV® for UNIX systems is based on dBASE IV version 1.1. The data manager that InfoWorld (8/20/90) calls "easy to use and productive."

Of course, dBASE IV is even faster and more productive on UNIX. Where it takes full advantage of a multi-user, multi-tasking environment with more memory, greater security, plus extended data storage and data sharing.

In minutes, you can port dBASE applications from DOS to UNIX systems like Sun, SCO 386 Xenix, SCO 386 UNIX, Interactive 386/*ix*, and others to come.* And when you port version 1.1 applications, you

* Some of the platforms listed may not be currently available. Contact Ashton-Tate Customer Service at (213) 329-9989 for up-to-date product availability information. dBASE, dBASE IV, Ashton-Tate and the Ashton-Tate logo are registered trademarks of

Cohesion keeps DEC glued to CASE

BY MARYFRAN JOHNSON
CW STAFF

Rather like a scatterbrained gardener with an armful of tools and no place to store them, Digital Equipment Corp. has harvested only sparse interest so far in its computer-aided software engineering (CASE) strategy.

Yet industry analysts said DEC may finally be getting its act together and persuading users to look more closely at the recently announced additions to its Cohesion software development environment.

"A CASE environment of the future is going to have to be able to move from one environment to any other environment," said Anthony Picardi, an analyst at International Data Corp. (IDC) in Framingham, Mass. "In the past, DEC has been open as long as everything was DEC to start with, but now they can target a bunch of IBM databases and operating systems, as well as Unix and VMS. They've got the three biggies."

DEC's Cohesion program is intended to provide customers with the ability to develop, deploy and maintain software in a multivendor environment. Cohesion is part of DEC's grandiose plan — called Network Application Support — for software integration over networks of multivendor systems.

"DEC now has a true repository with a published information model that [applications tools] vendors have access to," said Vaughan Merlyn, a partner at Ernst & Young's Center for Information Technology and Strategy in Boston.

"There's no question they've got something good going, but DEC still has to prove itself as a vendor who views software as a business," Merlyn added.

Users need explanation

With 40,000 installed sites of CDD/Plus V.4 — the precursor to CDD/Repository V.5 — DEC already has a hungry and captive audience for its CASE products. Still, analysts said the Cohesion strategy has been poorly explained to users.

"I'm a bit gray on what Cohesion is," admitted Bob Blackmore, supervisor of systems and programming at New Foundland Light and Power Co. in St. John's, Newfoundland. The company has been using CDD/Plus as its corporate data dictionary for several years.

Blackmore and other users expressed the keenest interest in linking together the mixed bag of CASE tools already in residence — a desire DEC is playing to with its myriad of third-party CASE toól partners.

In late 1989, DEC announced its foray into the CASE market but provided scant detail. In February 1990, the strategy was christened Cohesion. Last month, DEC finally announced some significant products and directions:

- New object-oriented version of CDD/Repository, allowing integration of CASE tools from third-party vendors. Delivery date: November 1991 for VMS and February 1992 for Ultrix. Prices range from $1,000 to $48,000.
- Publication in November 1991 of the Repository Information Model, which sets out a road map for information by describing the objects and their relationships within the repository.
- Application Control Architecture Services: a kind of network broker providing a key applications integration capability in a distributed environment. Available in September 1991, with developer kits starting at $450.
- A variety of package deals for rapid prototyping, transaction processing development, maintenance and re-engineering. One example: Cohesion for IBM Cross-Development allows users to develop software on a DEC system for IBM platforms with DB2 databases.

Another savvy move on DEC's part, analysts said, is packaging a variety of Cohesion tools, services and consulting assistance together to solve certain generic CASE problems.

"It makes it easier for the market to understand," Merlyn said.

The Cohesion for IBM Maintenance and Re-engineering package, for example, links a reverse-engineering tool from Hypersoft Corp. with Cohesion CASE tools, allowing developers to extract data definitions from existing Cobol applications on IBM systems and place them directly into the CDD/Repository.

Producing the first pieces of the repository's information model is also a critical step forward, particularly for shops with multivendor CASE tools.

"The metadata has to flow from one product to another," Picardi explained.

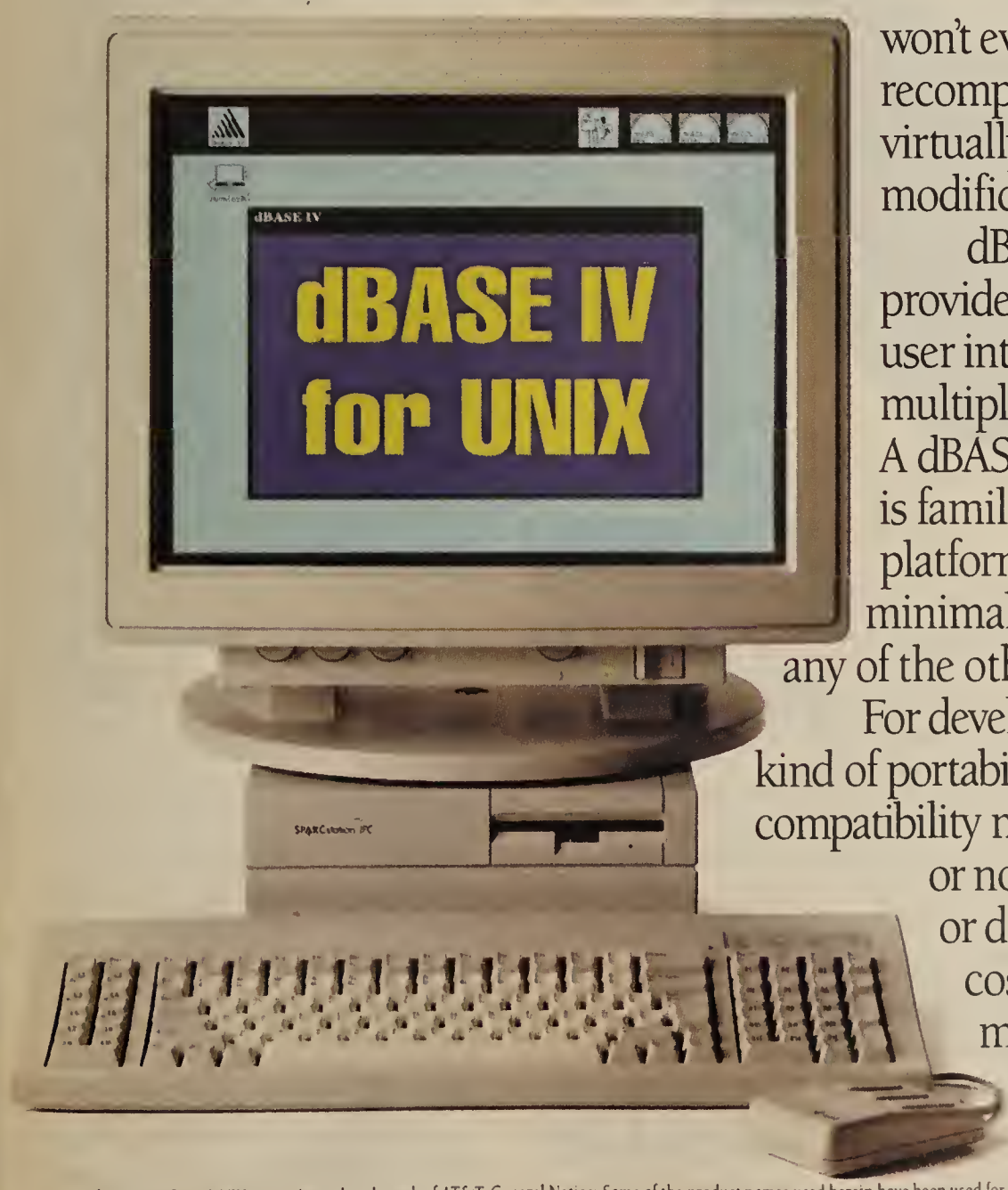
An example of that would be generating data using Cognos, Inc.'s Powerhouse, storing it in the DEC repository and then accessing it with tools from another vendor, such as Arthur Andersen & Co. or Information Builders, Inc.

DEC's new Application Control Architecture (ACA) services are supposed to provide that kind of functional linkage — allowing end users to custom-design their CASE environment with the work flow built right in.

"If a customer can buy ACA and some tools from DEC and then use their existing tools to build a custom environment, DEC will have a real coup de grace," Picardi said.

The use of CASE tools is still fairly limited at IBM mainframe and DEC VMS sites, however. In a recent IDC survey of 225 large IS shops, the expense of CASE technology was cited as the main factor preventing its adoption. Only 20% of the sites surveyed were using CASE.

Then again, the CASE segment of the applications development tool market has grown steadily from $164 million in worldwide revenue in 1985 to an estimated $1 billion in 1990, according to IDC figures.



won't even need to recompile. They'll run virtually without modification.

dBASE IV also provides a consistent user interface across multiple platforms. A dBASE IV user who is familiar with one platform will require minimal training for any of the other platforms.

For developers, this kind of portability and compatibility means little or no retraining or development costs as you move your applications and users to powerful UNIX systems.

dBASE IV for UNIX also means easy-to-use Fourth Generation Language (4GL) tools that maximize personal and application productivity.

Tools like the Report Designer, Form Designer, Query By Example, Automatic Code Generator, Template Language and Debugger all make prototyping and development quick and easy. There's SQL language capability, too.

To find out more about dBASE IV for UNIX, call us at 1-800-437-4329 ext. 1410.

Call now and experience a quantum leap in dBASE application portability and performance.

Ashton-Tate®

Ashton-Tate Corp. UNIX is a registered trademark of AT&T. General Notice: Some of the product names used herein have been used for identification purposes only and may be trademarks of their respective companies. © 1991 Ashton-Tate Corp. All rights reserved

User prototypes with Knowledgeware

BY ROSEMARY HAMILTON
CW STAFF

Washington Water Power Co. recently gave the OK to a software prototyping tool just released from Knowledgeware, Inc.

The Atlanta-based company began shipping Application Development Workbench (ADW)/RAD last month.

Kevin Jennings, an information services analyst at Washington Water Power, said the prototyping tool held up well during testing, although he is waiting for Knowledgeware to deliver both an IBM Common User Access graphical front-end component and a capability that would allow him to automatically load the prototyping data into his Knowledgeware design tools.

Jennings said Knowledgeware has promised to deliver both items by year's end.

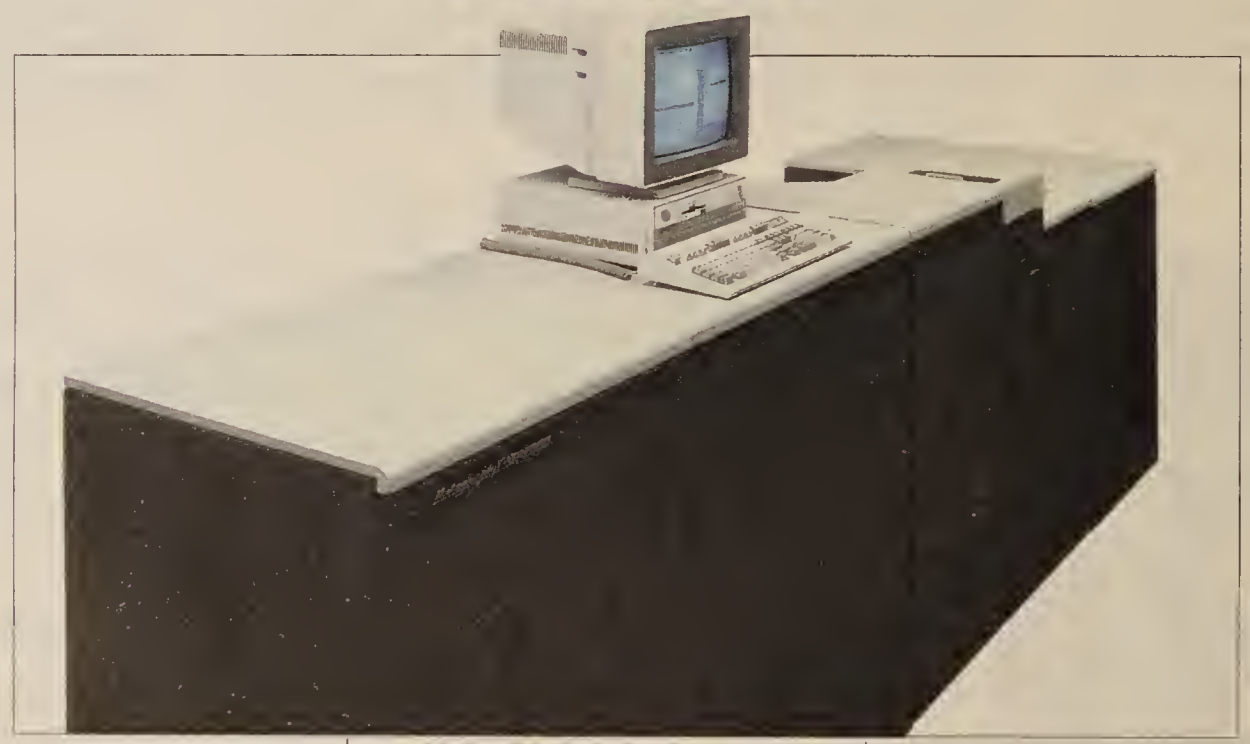
Currently, ADW/RAD creates screens in IBM 3270 terminal mode, and prototyping data must be re-created for the Knowledgeware design tool. Despite these limitations, Jennings said the tool greatly improves the design phase of software development.

"What I really like is you can sit there while your clients are with you and actually paint the screens, and it doesn't take that much time at all," Jennings said. "You get immediate feedback."

Previously, Jennings would create screens for an application, print out the results and send them to the users. They in turn would review Jennings' work and return it with comments.

Jennings said he hopes to use the tool for a software development effort under way that is moving many applications from a mainframe base to a client/server architecture.

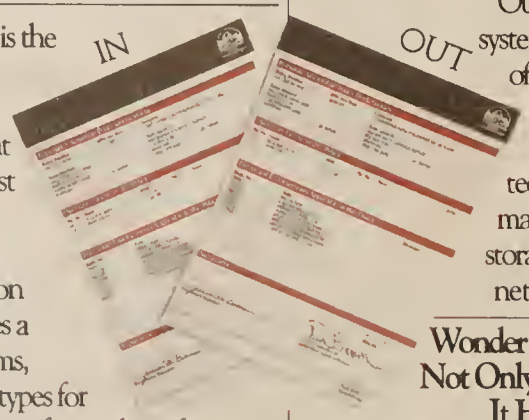
ANACOMP'S XFP 2000.
LOCATED JUST SLIGHTLY
BEYOND YOUR
IMAGINATION.



If you think micrographics is outdated technology, think again. Today, it has been combined with the best in computer capabilities. The result is Anacomp's DatagraphiX XFP 2000™ and a wondrous storage fiche we call "Wonder Fiche."

What You Put In Is What You Get Out.

The XFP 2000 is the only Computer Output Microfilm (COM) system that can deliver the latest in graphics technology. Our "Advanced Function Platform" duplicates a variety of fonts, forms, signatures and logotypes for perfect reproductions of everything from invoices to bank statements.



The Flying Fiche.

Our patented continuous motion laser imaging system produces fiche nearly twice as fast as any other micrographics system. It soars along at 30,000 lines per minute.

The XFP 2000 Not Only Connects With Any System, It Connects With The Future.

Our software-driven system is on the leading edge of micrographics, offering the capability to interface with technologies like magnetic and optical storage, scanners, local area networks and laser printers.

Wonder Fiche On Your Menu Not Only Makes You Smarter, It Helps Trim Fat.

The XFP 2000 reduces and organizes a 1,000 page report into four, 4 x 6 inch Wonder Fiche. So, you can reduce storage space to a fraction. A savings that alone could pay for the system.

And Wonder Fiche can make you an even smarter information manager. Anacomp's exclusive Anatrieve™ retrieval system lets you find a fact in a forest of information.

For more information write P. Lang Lowrey, Senior Vice President, Worldwide Marketing, Anacomp, Inc., 3060 Peachtree Road, N.W., Suite 1700, Atlanta, Georgia 30305. Or call 404-262-2667.

THE IMAGE OF THE FUTURE.
anacomp®

©1991 Anacomp, Inc. Anacomp and DatagraphiX are registered trademarks of Anacomp, Inc. DatagraphiX XFP 2000 (and XFP 2000) and Anatrieve are trademarks of Anacomp, Inc.

Betts

CONTINUED FROM PAGE 25

Our second stop is Dhahran, Saudi Arabia, where a computer software problem let a Scud missile slip past Patriot missile defenses, killing 28 soldiers during the war in the Persian Gulf [CW, May 27]. One of the many software problems contributing to that fatal error was what computer scientists call "clock creep."

The Patriot's missile-tracking software failed to lock onto the Scud partly because the tracking equation generated a round-off error of 10 millionths of a second every 10 sec., which accumulated to 0.36 sec. after the missile battery had been operating for 100 hours, according to *Aviation Week & Space Technology* magazine.

The U.S. Army-specified programming instructions figured the Patriot would be operating only 14 hours at a stretch, assuming it would be turned off daily and then rebooted to reset the clock. Unfortunately, this Patriot battery had run four days straight because its companion battery was down for repairs.

Our final stop is Bucknell University in Lewisburg, Pa., where Associate Professor Richard Zaccone is on a crusade to teach his computer-science students that the almighty computer is not so perfect after all. Zaccone and a graduate student are even starting to design software that would graphically illustrate the computer's computation processes, laying bare the magnitude of its errors.

Among computer scientists and mathematicians, it is well known that virtually every computer calculation has some degree of approximation or error — and, usually, it's too minuscule to matter. There are many reasons for the errors, but a primary cause is that computers can store only so many digits, which forces significant rounding for very big and very small (fractional) numbers.

The problem builds on itself when an imprecise result is then plugged into another formula, creating a cascading effect of increasingly wrong answers, Zaccone says. For society, the result could range from loan payments being off a few cents to catastrophic engineering failures (somehow, bridges come to mind).

The worst-case scenario for round-off problems is when very small numbers (such as 0.0000312) and very large numbers are multiplied or divided, because the change in a single digit can have a big effect on the outcome.

Using floating-point numbers (such as 3.14156×10^{23}) is dangerous because, as the number gets larger, the exponent increases but accuracy is lost because the number of digits is fixed, according to computer scientist Peter Neumann at SRI International in Menlo Park, Calif. The British have banned floating-point calculations in life-critical systems.

Why does this round-off problem, known since the beginning of the computer age, still haunt us? Computer scientists say it is mostly because of ignorance or carelessness; Neumann says more discipline in the software engineering process would help. But even with very robust processes and diligent programmers, errors will still occur, he adds.

It's a scary place, here in the Computer Error Zone.

Betts is *Computerworld's* national correspondent, based in Washington, D.C.

NEW DEALS

Law firm inks Wang deal

Ice Miller Donadio & Ryan, a law firm based in Indianapolis, recently inked a $1.1 million contract with **Wang Laboratories, Inc.** for a fully integrated document production and image management system. Under the terms of the contract, Wang will install an industry-standard Novell, Inc. Netware 386 Version 3.11 local-area network to support 250 Wang PC 350/16S desktop systems. The contract also calls for 126 laser printers and a gateway to other computer systems installed at the legal firm.

Amoco Chemical Co., a subsidiary of Amoco Corp., has signed an agreement to install several modules of the **Sap America, Inc.** R/2 System. R/2 is an on-line, real-time mainframe software package for a variety of business applications. Amoco has selected the financial accounting, materials management and sales and distribution modules to replace an order processing system. The software will be installed at Amoco Chemical's data center in Tulsa, Okla. Terms of the contract were not disclosed.

Cassano's, Inc., a chain of restaurants specializing in pizza and submarine sandwiches, has selected multiuser computers from **Motorola, Inc.** to automate all aspects of its business. Under the terms of the $1 million agreement, Motorola will supply Delta Series 3000 Model 3200 systems at each of Cassano's 48 company-owned stores and at corporate headquarters in Dayton, Ohio.

Dearborn Financial Services (DFS) in Dearborn, Mich., has chosen **Unisys Corp.** as the equipment supplier for its newly completed redundant backup processing site. DFS has installed two Unisys V510 mainframe systems, along with Unisys Item Processing System software for check processing and a Unisys M9710 disk subsystem. The upgrade is valued at approximately $3 million. Previously, DFS operated three Unisys V300 mainframe systems.

The **Air Force Systems Command** has awarded a $180 million contract to **Computer Sciences Corp.** for communications computer systems development, implementation and operation at 14 sites throughout the U.S. Services to be provided will include data processing and communications planning, systems analysis, systems engineering, software development and maintenance and systems integration. The two largest sites will be Hanscom Air Force Base in Bedford, Mass., and Wright-Patterson Air Force Base in Dayton, Ohio.

Star server aids MIT research group

BY SALLY CUSACK
CW STAFF

LEXINGTON, Mass. — MIT's Lincoln Laboratory recently purchased a supercomputing network server to provide supercomputing performance to a research group of Sun Microsystems, Inc. workstation users.

The server, the Star 910/VP from Star Technologies, Inc. in Sterling, Va., is based on Sun's Scalable Processor Architecture (Sparc). It provides up to 160 million floating-point operations per second of distributed, vector processing computing power to a local-area network that consists of 17 Sun workstations and a Sun file server.

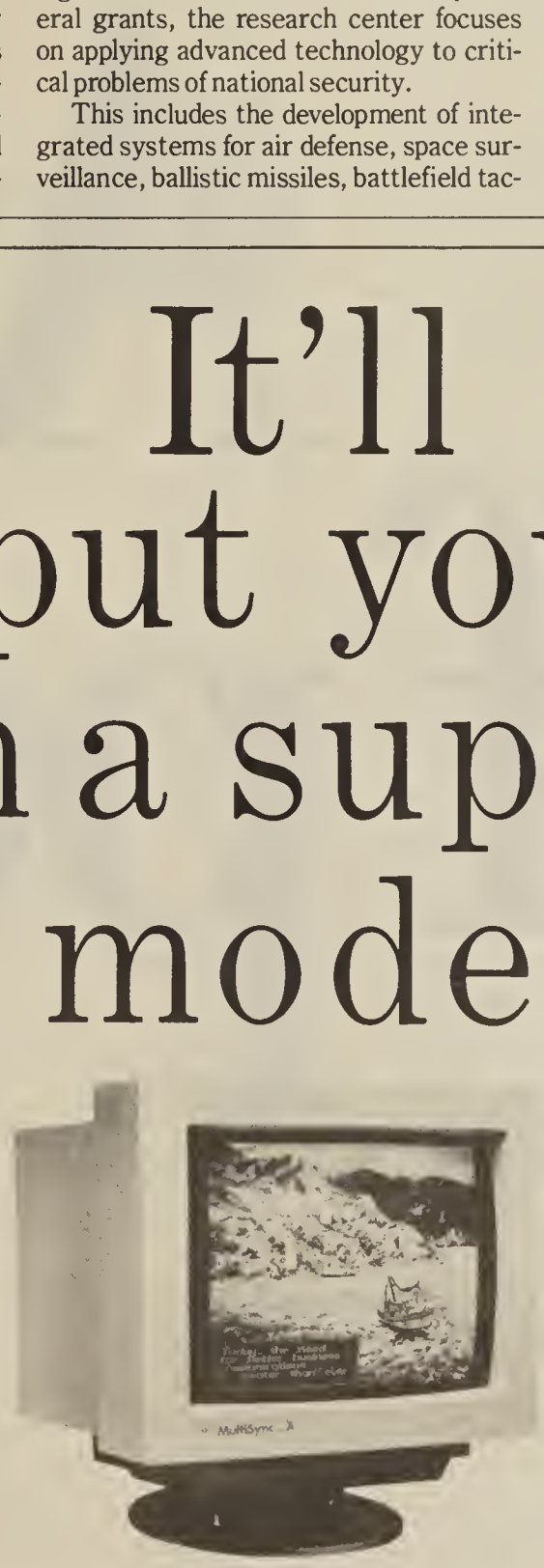
Lincoln Laboratory will use the server for a variety of high-performance applications, including computational fluid dynamics, statistical processing, radar and optical signal processing, image processing and neural networks. Funded by federal grants, the research center focuses on applying advanced technology to critical problems of national security.

This includes the development of integrated systems for air defense, space surveillance, ballistic missiles, battlefield tactics, satellite communications and air traffic control. Using the Star 910/VP, the laboratory will be able to increase the amount of computing power available to each user on the LAN.

The Star server provides support for a wide variety of existing Sparc applications software. Star Technologies offers several products targeted at the high-performance computing market, including servers, image generators and array processors. In addition to defense applications, they are used in design automation, simulation and training; seismic data processing; and medical imaging.

© 1991 NEC Home Electronics (USA) Inc.

It'll put you in a super mode.



Looking for something a little more uplifting in a monitor? Try NEC's MultiSync® 2A.

Not only is it compatible with regular VGA modes, but it has the ability to put you instantly into a super one. And since SuperVGA gives you 56% higher resolution, that's not a bad place to be.

The MultiSync 2A.

Proof that improving your mode can be as easy as changing the way you look at things.

NEC

DATAPreference MicroAge®

Formerly Leasametric Data Communications, Inc.

Northwest: 800.343.7368, 415.574.5797 • Southwest: 800.638.7854, 818.240.3244
Central: 800.323.4823, 708.790.2050 • Northeast: 800.241.5841
Southeast: 800.241.5841, 404.925.7980
©1991 Data Preference Incorporated

A true of power, and

*Current DOS users can purchase a 5.0 upgrade package. To order your version of DOS 5.0, see your IBM Authorized Remarketer, or call 1 800 IBM 7699 to order a single copy. IBM, Personal System/2 and PS/2 are registered trademarks and Micro Channel is a trademark of International Business Machines Corporation. 386 is a trademark of Intel Corp. © 1991 IBM Corp.

story of fame sx.

IBM brings its mastery of i386™ SX to a variety of new models.

When it comes to 386 SX technology, IBM just about wrote the book. Right from the start, the IBM PS/2® Model 55 SX hit the bestseller list, making it the leading 386 SX machine. And now IBM is opening a whole new chapter with 20 MHz models specifically designed to be more flexible and expandable.

The Personal System/2® Model 57 SX brings new levels of value to a Micro Channel™ PS/2, providing data integrity and increased performance in connected and multitasking environments. It comes with a new generation 2.88MB diskette drive and SCSI on the planar. The popular 55 SX has also been upgraded. It offers affordable Micro Channel performance, now with 4MB RAM and 40 or 80MB hardfiles. And our two newest AT-bus PS/2s deliver powerful performance at practical prices. The 40 SX offers full desktop expandability while the 35 SX packs its power into a smaller footprint. And with 132-column screen support, a new 122-key keyboard and IBM software, all new models can also run existing mainframe host terminal applications.

IBM also has new ways to improve PS/2 performance, starting with a new, faster, more user-friendly DOS 5.0. It requires less memory, yet offers advanced functions like built-in task switching and a full screen editor.* The new PS/2 3.5″ Rewritable Optical Drive offers 127MB media capacity with a 66-millisecond average seek time, and the new Model 8504 12″ monochrome display lets you view it all with high resolution and clarity.

To get the full story, including our "PC Trade-In Offer," contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438, ext. 386.

Models 35, 40 and 57 SX feature i386 SX 20 MHz processors, 16-bit VGA and 5.25″ internal drive capability. 80/160MB hardfiles are available on the 57 SX; 40/80MB on the 40 SX and 35 SX. Memory is upgradable to 16MB with 4MB standard on the 57 SX, 2MB on the 35 SX and 40 SX. The 40 SX and 57 SX each have five expansion slots and four DASD bays; three slots and two bays on the 35 SX. A medialess 35 SX LAN station model is also available with a Token-Ring Adapter standard.

How're you going to do it?

PS/2 it!

IBM

NEW PRODUCTS — SOFTWARE

Applications packages

Transarc Corp. has released its AFS distributed file system software for the Hewlett-Packard Co. Series 700 Unix workstation platform.

AFS provides a location-independent file access system on major reduced instruction set computing systems.

Pricing starts at $7,500 for a single-server, unlimited-client license.

Transarc
The Gulf Tower
707 Grant St.
Pittsburgh, Pa. 15219
(412) 338-4400

DCS Software and Consulting, Inc. has announced a new version of its Problem Managementplus help desk software for IBM Appication System/400 users.

The product includes multiple database support and a feature that allows help desk personnel to temporarily suspend a task to receive incoming problem messages. Security has also been enhanced.

The software costs from $950 to $7,600, depending on AS/400 model.

DCS
Suite 308
12700 Park Central
Dallas, Texas 75251
(214) 458-9711

Utilities

Jensen Research Corp. has released Xrefplus 2.2, an upgrade of the firm's job control language and procedure cross-reference utility. The new version supports flowcharting, user exits, IBM's system managed storage facility and Pansophic Systems, Inc.'s Panvalet.

Xrefplus runs on all MVS, MVS/XA and MVS/ESA systems. A three-year license for an IBM Group Processor 50 costs $8,800.

Jensen Research
Glen Rock Plaza
266 Harristown Road
Glen Rock, N.J. 07452
(201) 670-8000

SQL Solutions, Inc. has announced Top*Pl/SQL Converter, a tool for upgrading Oracle Corp. database applications that use Oracle's SQL*Forms development environment.

Top*Pl/SQL Converter automatically rewrites applications from SQL*Forms Version 2 to Version 3, taking advantage of the improved performance and transaction control of Version 3, the company reported.

License pricing for the Top*Pl/SQL Converter ranges from $7,500 to $25,000, based on hardware platform and number of users.

SQL Solutions
8 New England Executive Park
Burlington, Mass. 01803
(617) 270-4150

U.S.A. Toronto Bruxelles Paris London Milano Sydney

Changing software to fit your company is one thing. Finding software that fits the way your company changes is something else.

Good software should fit your company like a glove. But when your company changes and you grow out of your software, conventional wisdom says that you change the software as well.

At J.D. Edwards & Company,® we design software with principles rarely found in today's throwaway world: elevate software development from computer science to craftsmanship. Be obsessed with quality. Pursue innovative uses for CASE. Build upon our World Software Architecture.™ Prepare the customer for anything.

The results are tangible. Our products are easy to modify and maintain. They adapt to change without custom programming. And new applications may be integrated painlessly.

Our software fits because it is made to change. But our values never will.
J.D. Edwards & Company,® business software for the IBM AS/400.™ For more information, call 800-727-5333.

JDEdwards®

TRADITIONAL VALUES. NEW TECHNOLOGIES.

World Software Architecture is a trademark of J.D. Edwards & Company. AS/400 is a trademark of IBM Corporation. ©J.D. Edwards & Company 1991. All rights reserved.

HARDWARE

I/O devices

I-O Corp. has introduced two display stations for IBM midrange systems.

The 2500 series includes two single-piece models with monochrome displays and 83-, 102- and 122-key keyboard options. The I-O 2596 offers two concurrent sessions; the I-O 2576 offers three.

The 2596 model is priced at $895. The 2576 costs $1,095.

I-O
2256 South 3600 West
Salt Lake City, Utah 84119
(801) 973-6767

Equinox Systems, Inc. has developed an eight-port I/O subsystem for Unix platforms.

The Megaport 8CS features a multiprocessor architecture and eight RJ-11 jacks. It offers 38.4K bit/sec. performance to all ports.

The board costs $795. Versions with 12 and 24 ports are also available.

Equinox Systems
14260 S.W. 119th Ave.
Miami, Fla. 33186
(305) 255-3500

Processors

Star Technologies, Inc. has announced availability for a real-time image generation system, the Host-Integrated Graphicon 2000/PTX.

The HIG2000/PTX includes a Scalable Processor Architecture single-board computer, allowing integration with systems running the SunOS operating environment. A tool kit for applications prototyping and sample databases is included.

The HIG2000/PTX system costs $121,000.

Star Technologies
515 Shaw Road
Sterling, Va. 22170
(703) 689-4400

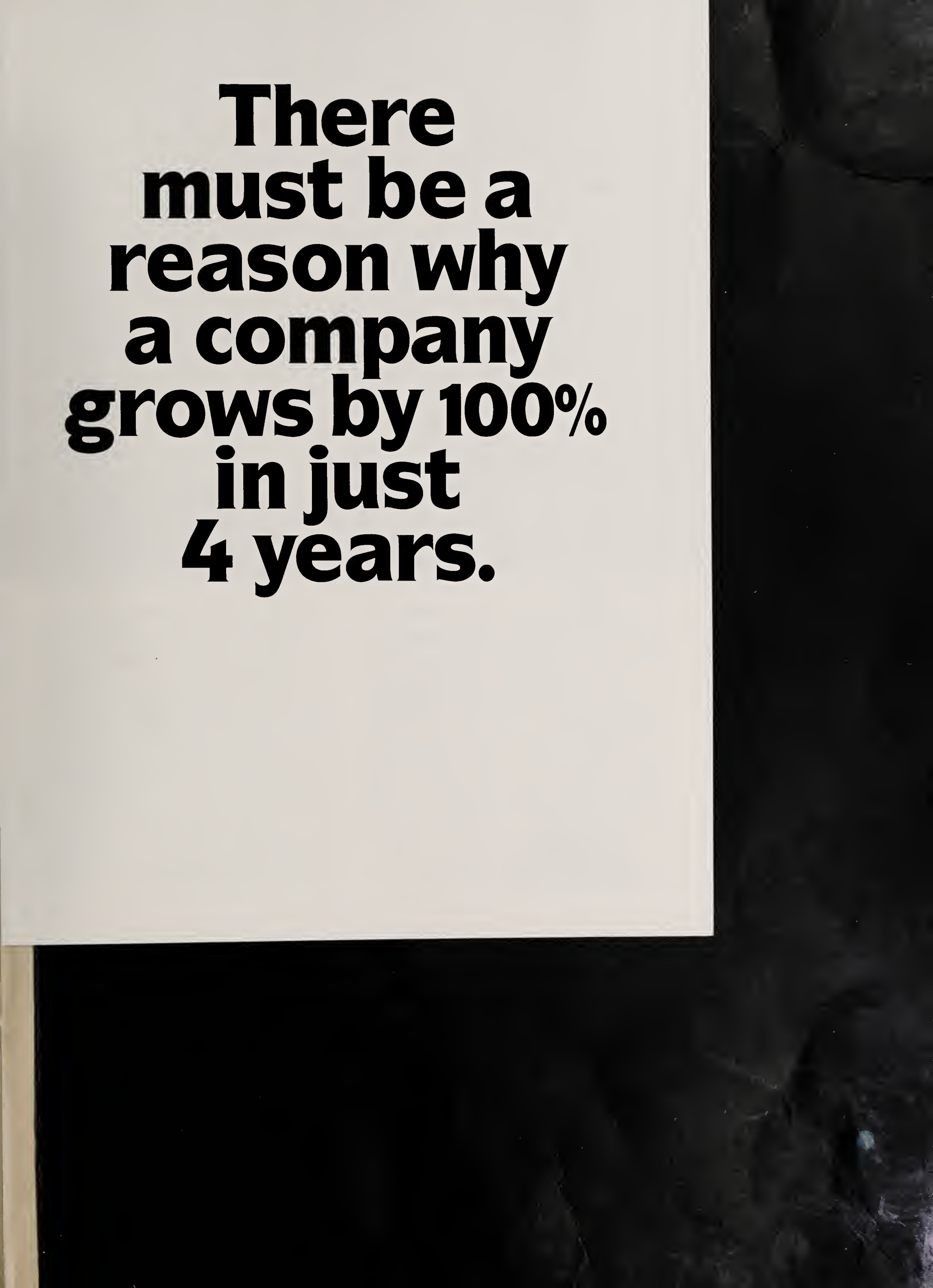
Data storage

Clearpoint Research Corp. has announced memory upgrades for the IBM RISC System/6000 workstation line.

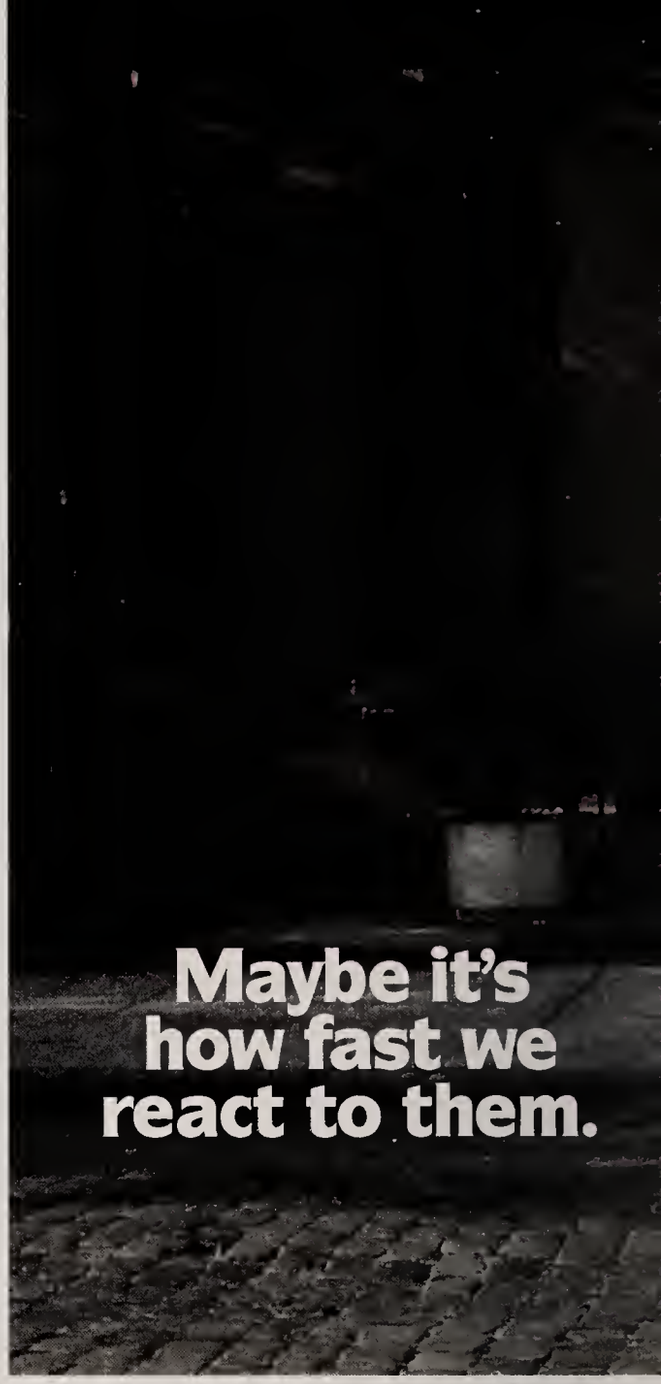
The upgrades are available in sets of 16M bytes ($3,520), 32M bytes ($7,040) and 64M bytes ($14,040). A lifetime warranty is provided.

Clearpoint Research
35 Parkwood Drive
Hopkinton, Mass. 01748
(508) 435-2000

There must be a reason why a company grows by 100% in just 4 years.



There must be a reason why MCI's 800 Service grew from 0 customers four years ago, to more than 100,000 today.



Customers seem to like how quickly we respond, as much as they like the quality of the response. And the fact that before we do anything, we listen. Listen to what the problems are.

MCI® has one of the world's most modern telecommunications networks, but the big reason we grew so far, so fast, is how we put it to work. For each customer.

MCI 800 Service℠ is always tailored to your company, not simply sold off the shelf or in packages that don't fit your needs.

Those needs can range from customer service to sales and marketing to internal communications. MCI 800 Services can be tailored to route calls to the right people and places, quickly. Either automatically, or by menu.

Peak loads can be planned for, overflow calls can be shifted automatically to other locations.

Calls can be managed by time of day, geography, product lines, zip codes, etc.

Your customers get their problems solved and your employees get the information they need quickly and easily. And changes in service can be quickly made on line—on your own or with MCI help.

We can help with fast installation when you need it as well. This can mean having MCI 800 service up in under 24 hours.

And if things go wrong—power failures, personnel shortages—emergency plans can be standing by. We know how critical your 800 service is to your business.

If you have international customers (or would like to), MCI can make your connections with 28 countries, and more are on the way. Toll-free calling can attract new customers, keep suppliers plugged in, and traveling employees in contact.

MCI 800 Service

24-hour installation for last minute needs.
Emergency backup and on-line control available.
Flexible call routing by time, geography, menu, department, zip code.
Significant cost saving/controls, along with unsurpassed quality.
International, national, regional, local.

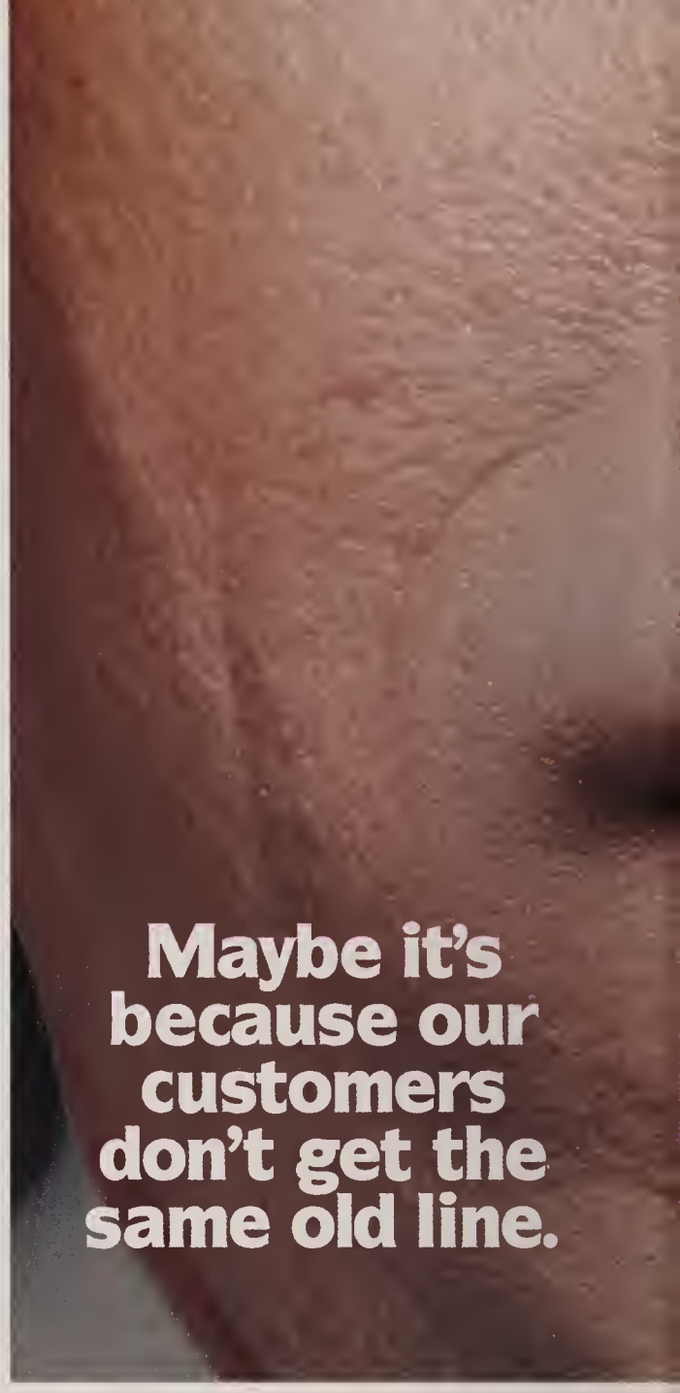
© MCI Telecommunications Corporation 1991

Beyond fast service from MCI, you can also look for comprehensive management reporting. Information that helps you control costs, build lead lists, track responses, and more.

MCI's spectacular growth has been based on delivering the value, the products, and the responsive people of MCI. And the quality and reliability of the entire worldwide MCI network. No wonder more than 100,000 companies have signed up with MCI 800 Service.

Call us and find out how fast we can move for you. Call 1-800-888-0800.

MCI®
800 Service



There must be a reason why MCI's Vnet business is 3 times bigger than it was 2 years ago.

Instead of "take-it-or-leave-it," instead of "that's the way we do it," there's another way of treating customers. The MCI® way. A real alternative. Including MCI's Vnet,® where we can show you the advantages of virtual networking. In short, the benefits of a private network without the cost of a private network.

In just a short time, MCI has built the capability to handle whatever you come up with. Voice, data, video and fax. Vnet is provided over MCI's predominantly digital network, with a robust advanced signaling system, along with the superior network intelligence and control you're looking for.

It's state-of-the-art, and building. And that goes from building to building, continent to continent, end to end.

So, we have what you need, and we'll work with you to put together a network that fits those needs. Like: flexible dialing plans, customized routing and screening, on-line database management, switched data services, traveling employee access and network management.

In short, we have the features you want, and we can deliver them in short order.

And right on the money.

In fact, we've got an invoicing and reporting system that's the best in the industry. With the accuracy, flexibility, not to mention the timeliness, you need. Plus you're able to choose exactly where the information goes.

From minute detail to executive summary, everyone can get just the information they need to get a handle on costs.

All this on top of the fundamental quality, reliability and value of the MCI network itself. All brought home to you by the very responsive sales, support and service people who simply won't give you the same old line.

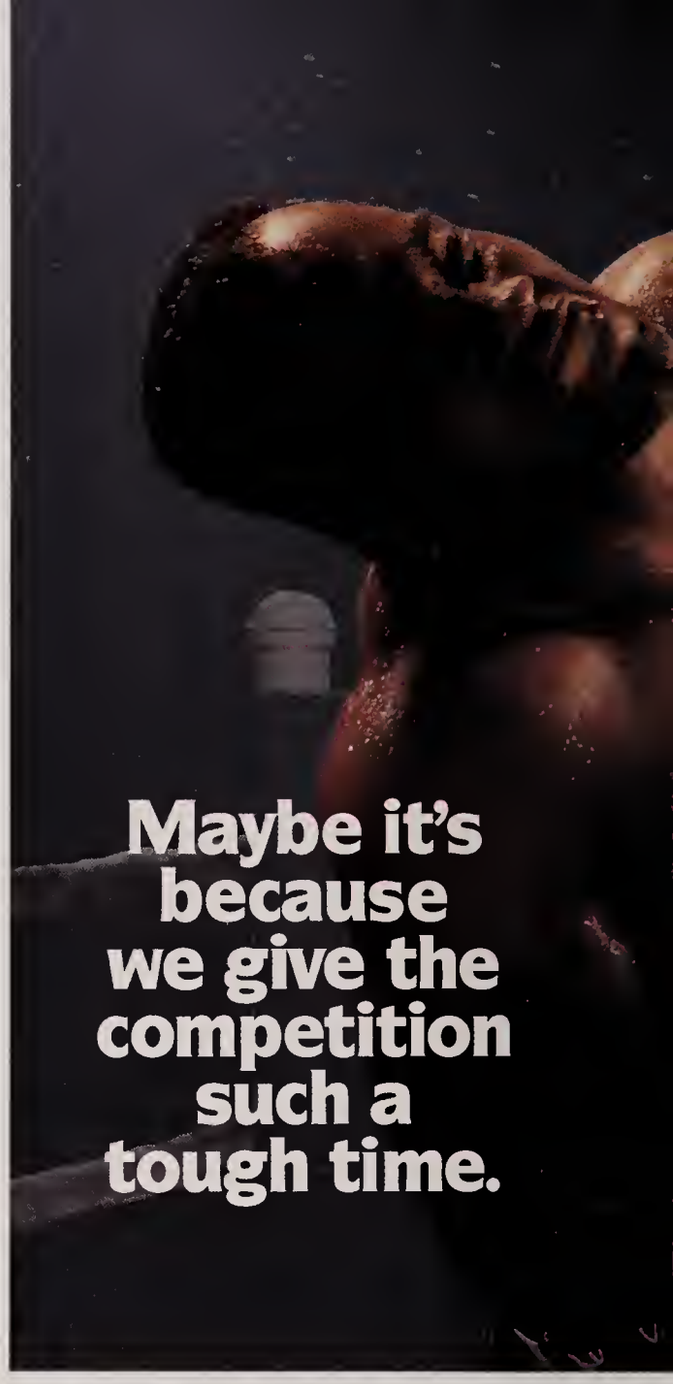
No wonder MCI's Vnet has made virtually hundreds of virtual network customers very satisfied. Why not join them? Call 1-800-888-0800.

MCI Vnet Service

MCI Vnet is a predominantly digital international network.
Superior network intelligence, with robust advanced signaling.
Full capability, efficiency and flexibility.
On-line database management.
Superior invoicing and customized call reporting.

© MCI Telecommunications Corporation 1991

MCI® Vnet



There must be a reason why MCI's data customers have tripled their business with us since 1986.

First MCI® shook up the industry in voice, and now—data. Along with an attitude that sets us apart from the other guys: we're easy on our customers, but mean to our competitors.

We're beating them to the punch by delivering high-speed Switched T-1 and Switched T-3 bandwidth on demand, whenever you need it.

But that's just the latest example of us working with our customers to develop flexible, high-speed, cost-effective communication services.

In fact, every day we handle everything from disaster recovery to time-sensitive fund transfers, to interconnecting LANs. All the while pushing for higher quality and lower costs. Like developing switched high quality video conferencing that's so affordable, it's actually useable.

We're also the first to install SONET—for even higher bandwidth and higher speeds. Operating at 2.4 gigabits per second, and carrying 32,000 simultaneous two-way data circuits on one fiber pair, MCI again is leading the way to new transmission pathways for data, voice and imaging applications.

Another MCI innovation is our Digital Reconfiguration Service,℠ so you can easily reconfigure your network or even add capacity, quickly and easily as traffic demands change.

No matter what, MCI people work with you

to put together the right technology, services, and creative solutions to meet specific applications.

And so that you're not trapped by techno-

MCI Data Service

High speed, high quality, high tech.
Switched 56, Switched T-1 and Switched T-3.
SONET multi-gbps/32,000 simultaneous 2-way channels.
Full capability and flexibility—worldwide.

© MCI Telecommunications Corporation 1991

logy or investments, these solutions can be adapted and modified as needs and times change, adding to their efficiency and value.

And this extends around the world. Because the MCI data network extends internationally to connect the U.S. to more than 250 countries. So you can make use of MCI's data network quality and reliability—worldwide.

And to continue to give the competition a hard time, we're keeping the pressure on them (and ourselves) to come up with more innovations.

Keep your left up, guys. Give us a call. 1-800-888-0800.

MCI®
Data Services

There must be a reason why MCI® has grown so much. Maybe it's our more than one million business customers.

They discovered "the right choice" wasn't the only choice. Much less the best choice.

They called MCI.

For Data, Vnet and 800 Services. And more.

They found MCI had the products and services they needed.

They also found MCI people ready, willing and able to help meet their unique telecommunications challenges.

With answers that weren't off the shelf or off the cuff.

For more reasons why MCI could be the answer for your company, maybe you should call 1-800-888-0800.

MCI®

"The right choice" is a service mark of American Telephone and Telegraph Company.

White paper no whitewash

Both users and publishers anticipate benefits from MMA compromise

BY PATRICIA KEEFE
CW STAFF

NEW YORK — The planned October release of the Micro Managers Association's (MMA) white paper on network licensing for software applications could provide developers with the antitrust shield they need in order to standardize on licensing procedures.

The paper will attempt to strike a compromise between making sure that publishers are accurately compensated for use of their products and making sure that users are not unduly burdened by unrealistic terms.

"It's a call for consistency," not a bid to evade paying developers, said Joanne Witt, a senior technology analyst in the Computer Technology Department at Siemens Medical Systems in Iselin, N.J. Witt also co-chairs the white paper committee.

Antitrust issues

Several months ago, Jim Manzi, chairman of Lotus Development Corp., said that he had tried to initiate discussion about licensing standards among his peers. But there were antitrust concerns.

"The antitrust issue is why we get so much pressure. [Software publishers need] someone outside of the industry to come up with a consensus that they can adopt," said D. Keith Herron, MIS director at Wild, Gotschall and Manchue in New York. Herron also co-chairs the MMA's white paper.

Developers are beginning to converge on a consistent, common approach, according to Software Publishers Association (SPA) President Gordon Eubanks. He predicted a move to concurrent licensing, which would allow any number of users on a network (up to a preset number) to use a package simultaneously.

"The swing is toward concurrent usage," agreed Stephen Mayner, a consultant at Blue Bonnet Savings in Dallas and a contributor to the white paper.

The key to resolving licensing complaints "is to really understand what the customer, as opposed to the industry, wants," Eubanks said, adding that he will read the paper "with eager anticipation."

He will not be alone. Growing network use coupled with the SPA's zealous antipiracy campaign has upped the pressure on systems administrators struggling to keep track of how many employees are using each networked package and whether that use corresponds with the license. A corporation might have 10 to 15 active programs. "It's becoming a management nightmare," Witt said.

So much so that when trying to decide between two comparable packages, users say, licens-

Continued on page 40

Licensing advice

Steve Mayner, a consultant at Blue Bonnet Savings in Dallas, has the following recommendations for software vendors:

- Test products against the top network operating systems.
- Provide concurrent use with lock-out counters.
- Provide additional documentation as a separate purchase.
- Provide price incentives for network versions.
- Provide flexibility in the size of LAN Packs, site licenses and entity agreements.

CW Chart: Janell Genovese

RISC tools to filter down to PS/2s

BY MICHAEL FITZGERALD
CW STAFF

SOMERS, N.Y. — The future of IBM's personal computer line is in the hands of a higher force.

Or so says Robert L. Carberry, assistant general manager of personal systems technology at IBM. Recently, Carberry told *Computerworld* that the RISC System/6000, IBM's powerful reduced instruction set computing (RISC)-based workstation, provides a "road map" for IBM's line of Personal System/2s.

"Basically what we're doing in the stand-alone environment is having a high degree of commonality in the subsystems [i.e., graphics, direct-access storage devices and communications functions]," Carberry said. He pointed to the common architecture of the two — both use the Micro Channel Architecture bus and have subsystem adapters such as small computer systems interface (SCSI). While the RS/6000 runs AIX, IBM's version of Unix, Carberry noted that there is similarity between the PS/2 high end and the RS/6000.

IBM's Carberry: *RISC provides road map for PS/2s*

Carberry said IBM's strategy is "to take subsystems adapters, like graphics and SCSI, and pull them down from the RS/6000 into the PS/2 product line."

For instance, IBM's Extended Graphics Array (XGA) video display technology first appeared on the RS/6000 and later was brought down, with some twists, to the PS/2 Models 90 and 95.

In the future, users should expect to see IBM introduce a 1,280- by 1,040-pixel resolution version of XGA on its high-end PS/2s and gradually migrate it down the line. Users may also see improved bus-mastering Ethernet and Token Ring adapter cards for the PS/95 and 90.

"We're bringing the Ethernet and Token Ring card from the RS/6000 and — watch this space — both of these will be announced as coming down [to the PS/95]," Carberry said.

Carberry added that IBM will pursue a "waterfall" strategy with product enhancements.

"Continuing to evolve a function at the box is also very much part of our strategy — SCSI, read/write optical, XGA you'll see come further down in the product line," he explained. "In the 90/95, SCSI is an add-in card. On the [PS/2 Model] 57, it's down on the planar board."

Carberry also said IBM will eventually introduce lower level PS/2s with upgrade paths.

Processor defined

IBM's Robert L. Carberry professed puzzlement at reports IBM was demonstrating a multiprocessor-based server device. "What we do have is a two-engine server. We have also demonstrated a four-engine database processing system. You can set it up as four semitightly coupled cards or a single system image of four Model 95s. We don't have a four-engine [server] announced."

AUGUST 1991

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1	2	3
4	5	6 Arlington, VA	7	8 Indianapolis, IN	9	10
11	12	13 New York, NY	14	15	16	17
18	19	20	21	22	23	24
25	26 Chicago, IL	27	28	29 Columbia, SC	30	31

Take the First Step Towards Increased Programmer Productivity . . . Attend The Micro Focus

Application Development Seminar

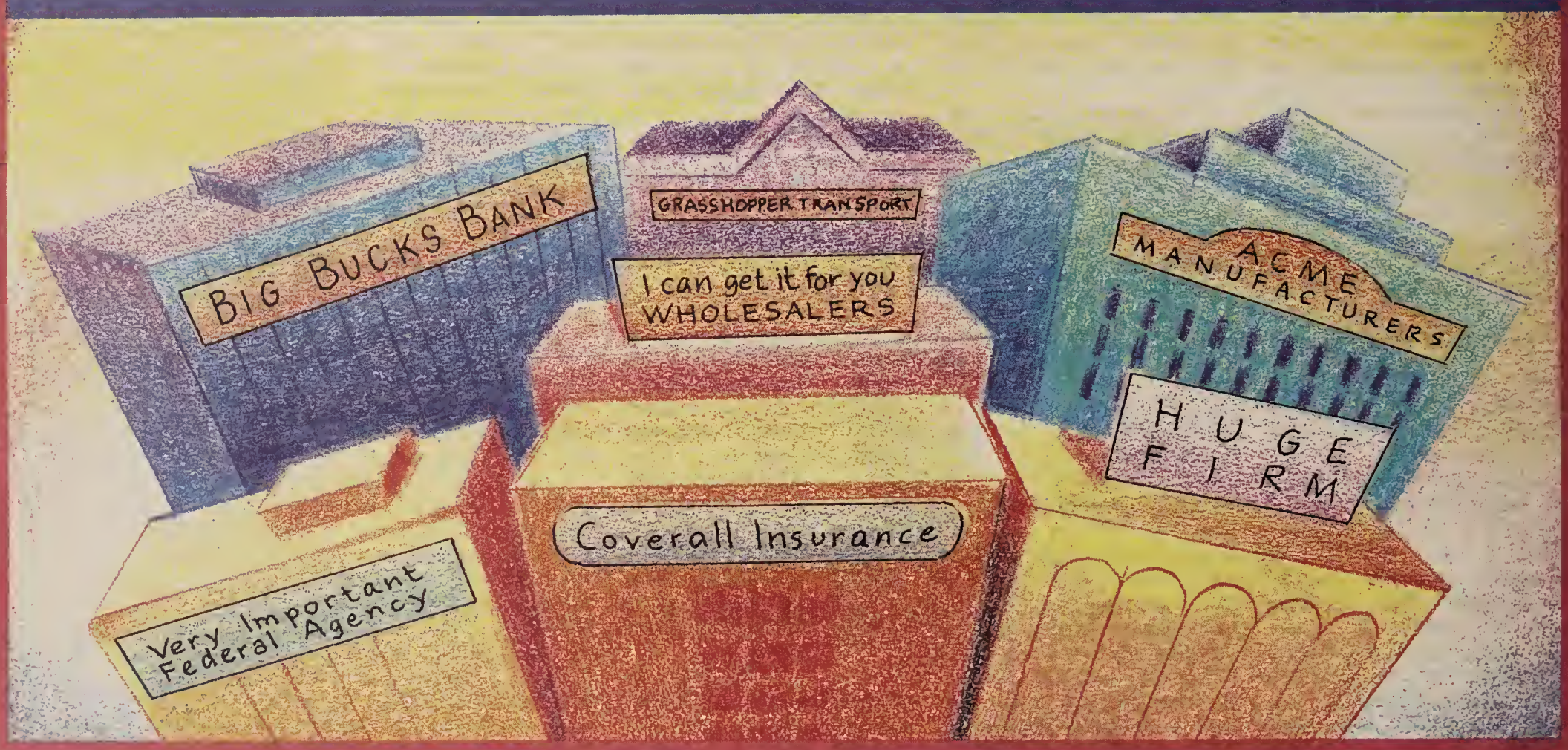
- Reduce costs and increase productivity at your shop with Micro Focus COBOL/2 workstation-based products
- Develop COBOL applications that take advantage of today's Graphical User Interfaces and cooperative processing architectures under UNIX, DOS or OS/2
- Move IBM IMS, CICS and DB2 application development off the mainframe to the PC

Call 415-496-7160 to register for the Micro Focus Application Development Seminar near you.

MICRO FOCUS®
A Better Way of Programming™

Micro Focus is registered trademark. Micro Focus COBOL/2 is a trademark of Micro Focus. COBOL/2 is a trademark of International Business Machines Corporation licensed to Micro Focus. IMS, CICS and OS/2 are trademarks of IBM. UNIX is a registered trademark of AT&T

NOW RISC IS OPEN FOR BUSINESS.



In the business world, speed alone won't get you very far. You need balance—of speed and overall systems performance. You need Digital.

Digital balances the power of our Unix®-based DECsystem™ RISC CPUs with high-speed I/O and memory, peripherals, and high-performance networking. That adds up to higher productivity for your commercial applications.

Digital's approach to open computing protects your investment as well. Our Network Application Support (NAS) software lets you integrate multi-vendor applications. We incorporate industry standards, like OSF/Motif,® POSIX, and X/OPEN® And our membership in the Advanced Computing Environment (ACE) initiative lets you take advantage of ACE-compatible products.

Of course, our UNIX-based DECsystems, featuring the 5100 and 5500, are fully ACE-compatible and are backed by Digital's unparalleled service and support network.

Are you open to the power of Digital's DECsystems working for you? Call 1-800-343-4040, ext. 268. To become a Digital reseller or applications provider, call 1-800-343-4040, ext. PARTNER.

ADVANCED COMPUTING ENVIRONMENT

digital™

© Digital Equipment Corporation 1991. The DIGITAL logo and DECsystems are trademarks of the Digital Equipment Corporation. UNIX is a registered trademark of UNIX Systems Laboratories, Inc. OSF/Motif are trademarks of the Open Software Foundation. X/OPEN is a registered trademark of the X/OPEN Company Ltd. in the UK and other countries.

DIGITAL. THE OPEN ADVANTAGE.

NEC offers lower prices

NEC Technologies, Inc. last week announced price reductions on graphics, desktop and laptop computer products and also made changes to its reseller pricing structure.

Retail prices were reduced on the Multisync series of monitors and graphics boards as well as Prospeed, Powermate and Businessmate personal computers. In all, more than 100 products received cuts.

The retail price drops were accompanied by reductions in the reseller discounts, making the retail prices "more accurately reflect" the street prices of the products, according to the company. It is unclear whether the new retail pricing will affect final end-user costs.

Reseller discounts on graphics products were dropped from approximately 32% to 28%. As an example of the retail price cuts, the Multisync 40 is now priced at $1,149, down from $1,499.

Final touches delay debut of Windows multimedia

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. has kicked back the general availability date of its Multimedia Extensions for Windows until the end of this month, while a third beta-test version undergoes last-minute fine-tuning. A June shipment date was originally planned.

"We're at 38 bugs and counting down," said U.S. Multimedia product manager Chris Doerr to an audience of software and hardware developers in London late last month. No substantive changes are expected as a result of the new arrival date, Microsoft officials said.

The extensions are a set of protocols that will allow audio, video and animation to be blended into traditional data presentations in an interactive manner. More than 2,000 beta copies of the extensions have gone out during their two-year development phase, according to Multimedia General Systems Group manager Rob Glaser.

The shipment of Microsoft's $500 Multimedia Development Kit has also been delayed for general availability until the end of this month.

Glaser added that the recent pact between Apple Computer, Inc. and IBM to co-produce multimedia products will have no effect on Microsoft's plans. The Apple and IBM "plans are very vague, and there's still a question of whether anything will ever actually come out of it," he said.

Seemingly affirming Glaser's view, IBM last week announced it will begin offering products using the Multimedia Extensions with Personal Systems being marketed to the higher education market.

IBM said it will begin shipping systems, software and system upgrade packages this month and in August.

Questions remain whether the Microsoft Multimedia Extension delays could also put a crimp in the shipment of multimedia personal computers from Tandy Corp. and Compuadd Corp. that are expected later this summer.

Extensions included

The five-member Tandy offering will be the equivalent of the company's current line of business computers with the Multimedia Extensions preinstalled. The machines will include a compact disc/read-only memory drive and will be priced from $2,599 to $5,499, approximately $250 to $800 more than similarly configured nonmultimedia Tandy PCs. They are expected to be in all 7,000 Radio Shack stores, officials of the Fort Worth, Texas-based chain said.

Later this summer, Austin, Texas-based Compuadd is expected to release an Intel Corp. 80386SX-based PC that provides photolike images, stereo sound, television, AM/FM and CD´capabilities. The Compuadd MPC setup is expected to sell for $2,995, while a multimedia upgrade kit will cost $895.

Microsoft officials gave developers a taste of multimedia's potential last month in London when they showed utilities and programs based on the extensions.

Doerr demonstrated an extensible Windows control panel as well as new audio drivers, a sound synchronizer and a waveform editor.

Analysts said the Multimedia Extension offerings confront the most important hurdle facing the widespread integration of multimedia into the DOS world: a severe lack of software.

Software houses have so far targeted most of their multimedia development efforts at more graphically oriented PC platforms such as Apple's Macintosh and Commodore Business Machines, Inc.'s Amiga. With the introduction of Microsoft's Windows 3.0, however, the DOS world suddenly assumed a more graphical feel.

DEC pumps up printers for meatier market

BY CAROL HILDEBRAND
CW STAFF

Digital Equipment Corp. is turning up the juice on its Printserver family of network printers, revving up its entry-level product into the Turbo Printserver 20 Network Printer. In doing so, DEC has tightened its bead on the network printing market.

The Turbo Printserver, which will be available next month, prints 20 300 dot/in. pages per minute, with a duplex rate of 16 page/min. Using Postscript, Adobe Systems, Inc.'s page description language, the printer is aimed at an environment that prints up to 70,000 pages per month. The box can print text, graphics and imaged products clearly on the same page, said Larry Cabrinety, a group manager at DEC's Video, Image and Print Systems Group.

The printer is aimed at a midrange niche, competing against such products as the PS 2000 from QMS, Inc. (which uses a faster controller from Mips Computer Systems, Inc.), and Hewlett-Packard Co.'s 3SI.

Five times faster than its predecessor — which will be phased out — the Turbo can be accessed simultaneously from VMS Decnet, Ultrix Decnet, Ultrix Transmission Control Protocol/Internet Protocol (TCP/IP) and/or Unix TCP/IP. It connects directly to standard Ethernet and supports printing from DOS, OS/2 and Apple Computer, Inc.'s Macintosh environments via Pathworks, the company's proprietary networking software.

"This will fit a niche market for people who want high-speed printing today and are willing to pay the price," said Rob Auster, director of the Electronic Printing Group at BIS Strategic Decisions in Norwell, Mass.

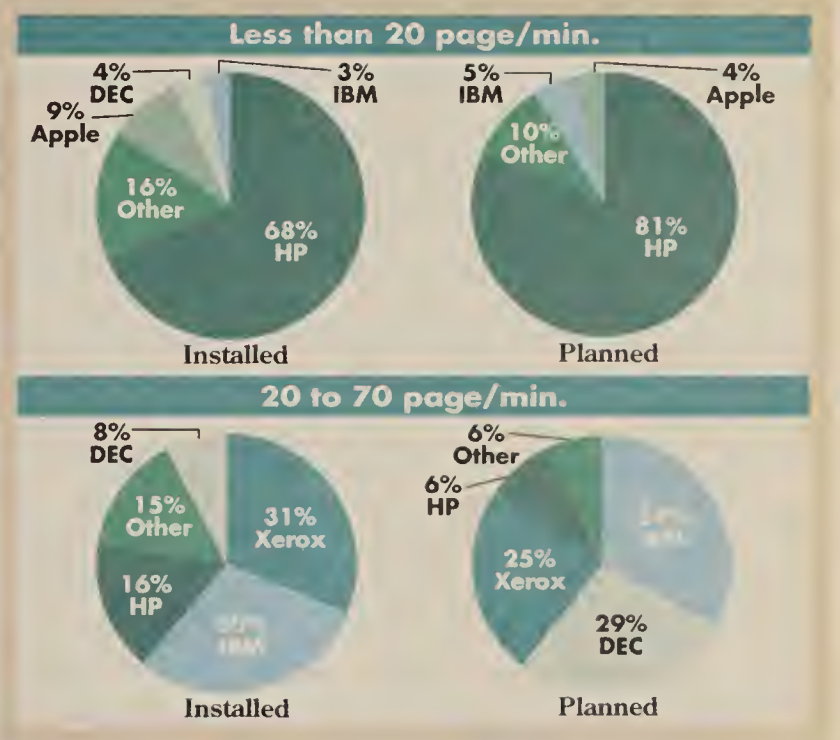
While HP dominates the low-end printer market, DEC is making a bid in the midrange arena with its family of networked printers. In fact, according to a separate survey by BIS, network printing will be the fastest growing market for printers during the next four years.

However, DEC's definition of network printing may not be the industry norm. Analysts found that DEC's network printers are still basically proprietary.

Auster said he expected two hallmarks of the network printer market to be extreme price sensitivity and flexibility. At $19,495, the Turbo is on the high end.

Can't do everything

No one comes close to Hewlett-Packard Co. in the low-end page printer market, but DEC appears poised to leapfrog over it in the medium speed class



Source: Computer Intelligence

CW Chart: Janell Genovese

XDB. DB2 ON YOUR PC.

It Saves.
Why use expensive mainframe CPU cycles for development that could be done faster and easier on the PC? XDB-Workbench for DB2 lets you develop and test COBOL programs with embedded SQL on your PC.

PC WEEK "The cost-benefit ratio is tremendous. PC development platforms—as opposed to the mainframe—offer consistent and rapid response, and richer tools for testing."
Jim Graves, Ford Motor Company

It Works.
If your application runs on XDB-Workbench it will run on DB2. No compromise. No expensive application recoding needed. The XDB-Workbench provides complete DB2 functionality on your PC.

COMPUTERWORLD "Because it supports DB2's syntax, error codes, data types, and semantics, XDB is an excellent DBMS for developing DB2 applications on a PC."
Richard Finkelstein, Performance Computing

It's Proven.
Over 10,000 XDB-Workbench installations are offloading DB2 development to the PC. It works perfectly with both Micro Focus COBOL/2 Workbench and Realia COBOL for complete DB2 application development.

DBMS "It runs on the mainframe just like it did in the PC environment."
Earl Hoskins, AT&T

So get off your mainframe and put XDB on your PC.
Call 301-317-6800
xdb XDB Systems

XDB Systems, Inc. 1991 XDB is a registered trademark of XDB Systems, Inc. DB2 is a trademark of IBM Corp. Other product names are trademarks or registered trademarks of their respective holders. PC Week June 12, 1989 Computerworld December 17, 1990. DBMS January 1990

DOS 5.0: Dramatic upgrade with few flaws

Microsoft Corp.'s DOS 5.0

Reviews	Ease of use	File management	Memory management	Compatibility	Utilities	Documentation	Service and support	Value	Overall comments
PC Magazine July 1991	Subtle improvements	Efficient, responsive	Utilizes extended memory well	Excellent	Incorporates standard functions	Thorough coverage	NC	Sure to entice users	Thorough overhaul
PC Week June 10, 1991	Modest but handy shell	NC	Vast improvement	NC	Not well integrated	Rewritten manual	NC	Good reason to upgrade	Lives up to billing
PC World July 1991	Easy-to-use interface	Emulates Windows	More free memory	May uncover hardware weaknesses	A bundle of extras	NC	NC	A must have	Best DOS ever
Users									
Richard Eisenman, Manufacturers Hanover Trust Co.	■■	■■	■■	■■	■■	■■	■■	■■	Great memory management
Eric Rintell, Purchase, Ltd.	■■	■■	■■	■■	■■	■■	■■	■■	Most significant DOS upgrade
Bruce Gavin, Online Reference	■■	■■	■■	■■	■■	■■	■■	■■	I am thrilled
Analysts									
Michael Masterson, Masterson Consulting	■■	■■	■■	■■	■■	■■	■■	■■	Useful improvements
Karen Offerman, Datapro Research Corp.	■■	■■	■■	■■	■■	■■	■■	■■	Important upgrade
Paul Cassel, Techtryx Systems	■■	■■	■■	■■	■■	■■	■■	■■	A must buy

Key: ■■ Very good ■■ Good ■■ Fair ■ Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys.
NC: No comment

Technology Analysis — A roundup of expert opinions about new products. Summary written by free-lance writer Suzanne Weixel.

Microsoft Corp.'s DOS 5.0 features built-in memory management and a revised interface as well as on-line Help and data recovery utilities that users have been clamoring for. Although none of the improvements is a technical breakthrough, reviewers reported that the upgrade is well-implemented.

Ease of use: Subtle changes to old utilities enhance DOS 5.0's ease of use. For example, the new DIR command lets users sort listings, and the new FORMAT command permits quick disk reformatting. The DOS shell has been completely rewritten to simplify file manipulation and applications launching. The package also works well through mouse commands. According to reviewers, the new shell looks a lot like Microsoft's Windows 3.0 — and even offers a primitive task-switching facility.

File management: Enhancements to the DOS shell and command utilities have improved the file management capabilities of DOS 5.0. The shell combines the functionality of a program manager and a file manager.

Memory management: DOS finally has enhanced memory management. By loading itself into high memory, DOS leaves more memory free for applications and data. According to *PC Week*, users of 80386- and I486-based systems have to customize the CONFIG.SYS and AUTOEXEC.BAT files to get the most from DOS 5.0's memory management capabilities. Reviewers said systems powered by at least an 80286-based processor will end up with 623K bytes of additional work space.

Compatibility: Reviewers said DOS 5.0 is highly compatible with existing applications, drivers, utilities and networks. With older systems, DOS 5.0's memory management may uncover some hardware weaknesses. But commands are available to help out if older applications refuse to run.

Utilities: Notable among DOS 5.0's new utilities, reviewers said, are the following: an improved installation procedure, which includes an uninstall capability that lets users revert to an old DOS version if they run into trouble; UNDELETE and UNFORMAT data recovery utilities; a full-screen text editor to replace EDLIN; a macro facility; and a built-in version of Quickbasic to replace Gwbasic. Reviewers said the well-integrated environment makes up for the fact that certain utilities are inferior to some third-party packages.

Documentation: Microsoft has completely rewritten the DOS manual. The two softcover books detail the use of DOS at all levels of expertise and include thorough information about each command and shell function.

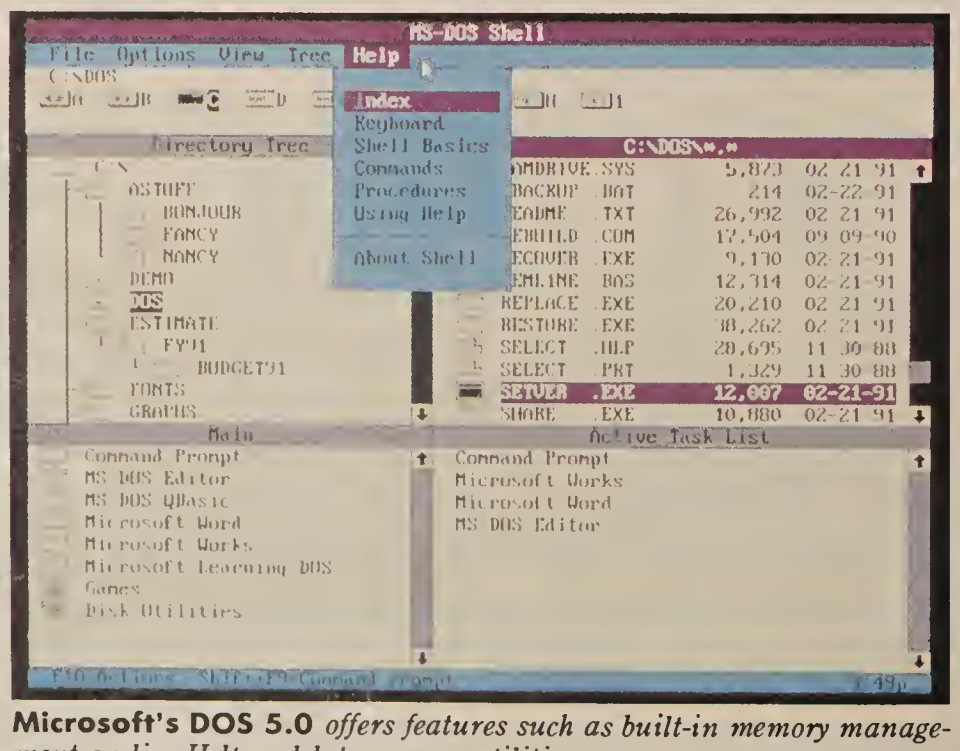
Service and support: DOS 5.0 is the first version of DOS sold directly to end users and the first covered by Microsoft telephone support.

Value: According to reviewers, no matter what system users have, and no matter what applications they run, they will benefit from upgrading to DOS 5.0. DOS 5.0 costs $99.95; the Master License Pack for network installation costs $79.95 per user.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance	Outlook
Peter Rogers, Robertson, Stephens and Co.	■■	■■	Very good
W. Christopher Mortenson, Alex. Brown & Sons, Inc.	■■	■■	Very good

Microsoft Corp., based in Redmond, Wash., reported third-quarter (ending March 31, 1991) net income of $123.8 million, compared with $75.2 million for the same period last year. Sales were $486.9 million for the quarter compared with $310.9 million last year.



Microsoft's DOS 5.0 *offers features such as built-in memory management, on-line Help and data recovery utilities*

Microsoft responds

Brad Chase, group product manager:

Ease of use: The task swapper is not really that primitive. It is just a swapper, not a multitasking feature.

Memory management: If you have at least 64K bytes of extended memory, DOS 5.0 automatically loads itself into high memory. We made it optional to load the device drivers and other programs up high because some people use other memory managers and because we did not want to scare the less sophisticated user who may not need to do it at all. It does take a bit of work, but for a sophisticated user, it is not difficult.

Compatibility: Whatever function your system is capable of, MS-DOS 5.0 supports it. Even the oldest or lowest end systems get the shell; dragging and dropping files; file management; on-line Help; recovery utilities; and task swapping.

Utilities: We wanted to be sure that we included all of the basics that users need, not every single utility that some users need some of the time. We took our time to make sure that the product works as an integrated, useful environment.

NEXT WEEK

▶ Adobe Systems, Inc. and Aldus Corp. offer users a choice between differing but equal strengths with Illustrator 3.0 and Freehand 3.0.

DOS 5.0 price lowballing raises corporate options

BY CHRISTOPHER LINDQUIST
CW STAFF

Buyers of Microsoft Corp.'s MS-DOS 5.0 upgrade are finding truth to the saying "Nobody pays retail anymore." But exactly how much below retail is another question.

Lowballing in the retail channel on DOS 5.0 pricing is affecting some corporate negotiations with Microsoft. G. Jeffrey Knepper, director of tax technology at Deloitte & Touche in Washington, D.C., said those prices will definitely be part of his discussions with Microsoft, in part, he acknowledged, because management is looking at street prices and will be "asking tough questions to the guys who negotiated the price upgrade."

Microsoft has an upgrade process and price for corporations, which is fine, Knepper said. However, "we've got to look at the rest of the world," Knepper added, noting that corporations may get one price while users who walk in off the street get another.

Individual pricing

Pricing for individual upgrades tended to hover in the $59 to $69 range, according to several software dealers. Users buying multiple copies of the upgrade can get better pricing for the Microsoft license package, which contains no disks or documentation.

Under Microsoft's 100% upgrade plan, a company that agrees to upgrade all of its machines at a particular site can obtain the product for a suggested retail price of $37 per unit in quantities of 5,000 or more. However, users can expect to find prices that are almost equal to those on smaller numbers of upgrades if they are willing to do some shopping.

Egghead Discount Software is currently offering MS-DOS 5.0 upgrades for a $59.95 sale price. Purchasers can then fill out a questionnaire and receive an instant $20 rebate, bringing the price down to $39.95, a rate several sources said was probably below the company's cost.

Some sources termed Egghead's practice a loss leader tactic to get people into the stores. Others indicated that Egghead may be putting together a mailing list, possibly for sale. An Egghead spokeswoman confirmed that the company is using the information for an internal mailing list, but she added that Egghead has not sold its lists in the past and has no plans to do so now.

Corporate Software, Inc. in Canton, Mass., is offering 100% upgrade participants a price of $35 per unit on 5,000 or more upgrades. As another promotion, buyers of 500 or more copies of the DOS upgrade can receive the same number of copies of Central Point Software's PC Tools Version 7.0 for $35 per copy, according to a spokesman. Such promotions as bundling the DOS upgrade with Microsoft's Windows, mice and other products are also commonplace.

Perhaps surprisingly, it may be cheaper for buyers to go with IBM's version of the upgrade. Ron Adinolfi, a vice president at Swiss Bank Corp. in New York, said he will be upgrading approximately 900 systems with the IBM upgrade — at about $29 each. That is a price several software dealers said they could not touch with the Microsoft upgrade.

Jack Schwinn, a corporate sales representative at Coresoft in Shrewsbury, N.J., said that price quotes on "larger" numbers of IBM upgrades could "very well be in that neighborhood" of $29.

Even with the potentially low prices, it appears that big organizations are just beginning to place their orders. The Corporate Software spokesman said larger sales are beginning to filter through, after a slow start. He indicated that many large companies go through extensive evaluation periods before purchasing new software.

WORM big winner for bookies

Securing bets no gamble these days with optical-based storage technology

ON SITE

BY JAMES DALY
CW STAFF

LAS VEGAS — Leroy's Horse and Sports Palace is not the sleekest looking gambling house in the world. It's a sad-looking old structure with a well-used bar on the right side, a long gambling counter on the left and hundreds of hopeful bettors playing the ponies or hoping the Dodgers can snap a losing streak.

In a compact room not far from the cigarette smoke and well-thumbed racing forms, however, is one of the most modern automated bookie operations in the world.

Just off the main parlor, owner Vic Salerno taps into the power of optical-based storage technology to keep tabs on the thousands of sports teams and horse races on which fortunes are won and lost.

"If you consider the amount of information we're constantly handling, it isn't all that surprising that bookies are computerized," said Salerno, a former dentist who is also the executive vice president of United Computerized Betting Systems, Inc. Like many an information systems manager, bookies need to keep track of a lot of varied information and having instant access to that information can affect their bottom line. They also need to know that the data cannot be altered or erased.

In the past, Leroy's used the "pen-based" system: Gamblers scribbled bets on slips of paper and passed them over the counter. It was a shaky procedure at best. Numbers could be altered or deleted easily and bets could be written after a game had started. "There were almost no controls on sports bets," Salerno said.

Homegrown system

When the Nevada Gaming Commission ruled that all race and sports books must be computerized by June 1988, Salerno faced a dilemma. He was not happy with the available computer betting systems, so he put together his own: A system designed by bookies for bookies. "Our main concern was that we wanted to preserve the customer experience — we didn't want it to look anything like computers," Salerno said.

The unique characteristics of write-once read-many (WORM) optical storage made it perfect for high-security, long-term data storage and retrieval. WORM technology works by using a high-power internal laser to burn tiny marks into the optical disc, thus changing the reflectivity of the spot and recording the data. A lower power laser is later used to read the marks. The laser markings are permanent, so files cannot be accidentally or purposefully erased or altered.

Leroy's Horse and Sports Palace *agents use a WORM-based system to handle bets*

Leroy's WORM system, which is linked by modem to 18 other betting sites throughout the state, uses a personal computer equipped with a Plasmon Data Systems, Inc. 940M-byte optical disc.

The setup was jointly developed by Salerno, partner Javed Buttar and RDS Information Systems, Inc., a local information management company. RDS officials say that the entire system costs approximately $16,200: $10,000 for the software; $3,700 for the optical system and drive; and $2,500 for a 25-MHz Intel Corp. 80386-based PC with a 100M-byte hard drive and an IBM Video Graphics Array monitor.

Once they are ready to put their money where their mouths are, bettors hand over their numbers to ticket takers who give them computer-generated slips. Gamblers may also process their betting slips though an optical reader, which generates tickets instantly.

Tracking wins and losses

Every race and sports bet is entered into the system by those working at the betting counter. By tapping into a bank of IBM personal computer clones, Salerno can instantly see every payout entered by the cashier and how his bets stack up. If Salerno needs to reference past bets, he can pull up any piece of information from any report posted in the past eight months.

"It tells us where we stand, down to the dollar," he said.

The WORM system is not only a tremendous success at Leroy's: It has been purchased by 65 of the 72 legal race and sports books in Nevada. "This is light-years ahead of the old method," Salerno said. "Betting will never be the same."

St. Louis bank takes RISC to trading floor

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

ST. LOUIS — The Boatmen's National Bank of St. Louis took a risk when it decided to open its trading floor, but so far, the company is pleased with the progress of its first Unix development, a $5 million effort.

In August 1990, Boatmen's — the largest bank in St. Louis with $15 billion in revenue — began to implement a reduced instruction set computing (RISC) workstation-based distributed processing scheme for its trading floor, which was based largely on stand-alone personal computers. The bank had started to consider the move to distributed processing three years before it began the project, scheduled to be completed in the first quarter of 1992.

Joseph H. Hempen, senior vice president of Boatmen's, a subsidiary of Boatmen's Bancshares, Inc., said the move toward a Unix-based distributed environment happened because of advances in PC technology and the development of good Unix trading applications.

"We felt a multitasking operating system [like Unix] was more in line with the nature of the underlying business," Hempen said. "The natural way of traders is to do a number of things in simultaneous fashion."

On the hardware side, Boatmen's trading floor is centered on a Hewlett-Packard Co. 645 and an HP 845 as file servers. These link over Ethernet to 15 clusters of seven to eight workstations each, a one-to-one mix of HP Apollo Division 400Ts based on Motorola, Inc.'s 68030 chip or X terminal stations, with an HP box as a file server. Traders work on the RISC stations, and the X terminals are used for administrative tasks.

The network is based in St. Louis, with hardware also running in offices in Kansas City, Mo., and slated to be installed in Springfield, Mo., and an Oklahoma site as well. Boatmen's will also roll out the project at 20 to 30 branch sites in the Missouri and Oklahoma areas, using existing lines and, where necessary, new T1 lines, and it will add at least two Snakes for added processing power, according to Hempen.

The basic software package is a custom-developed Unix on-line transaction processor called InTrader, written by Minneapolis-based Digital Solutions, Inc. Boatmen's is currently running two modules: one for federal funds and one for commercial paper. Hempen said these are small projects being used as tests, with the bulk of the software modules scheduled to be implemented later this year.

"We're very happy with them so far," Hempen said. "This is somewhat of a beta-test site, so there've been some bugs and things that have to be reworked, but we expected that going in."

Hempen added that it remains too early to gauge effective results, outside of quicker processing times and improved flexibility.

The project has changed since its August start. Originally, Boatmen's intended to go with a joint Unix-DOS solution, running HP's New Wave product as a manager. But Hempen said New Wave was "dumped" in late October or early November.

"New Wave was the PC part of the solution, and since we decided to use an X terminals approach, it negated the need for New Wave," Hempen said. Hempen said the bank moved away from New Wave to simplify its development process.

Besides New Wave, Boatmen's major obstacle was to rewire its entire trading floor, Hempen said. This was not as difficult as it might have been, thanks to foresight: Boatmen's had raised floors in place.

White paper

FROM PAGE 35

ing policies are beginning to carry some weight.

At minimum, users are beginning to revolt over conflicting, and at times impossible to implement, network licensing policies.

For example, one licensing agreement required each user to have a copy of the license, which in that particular case was a plastic card, said G. Jeffrey Knepper, director of tax technology at Deloitte & Touche. "I can't be running around across a 10-floor, five-campus environment passing cards around and then trying to get it back when they are done," he said.

Few other policies

There are only a handful of licensing policies beyond the "one user, one copy" approach. These include concurrent usage (also called metering) per workstation and a blanket network license.

The bigger issue for users is the fine print. "How do you remember 15 to 20 different sets of fine print? How do you associate it with the correct package?" Knepper asked.

"It's nice to be trusted, but give us the tools that will help us track the license better," Mayner said, adding that he does not mind software with restrictions. "It helps me make sure I'm legal."

To be sure, there are counters, either built into the software or provided through add-on monitoring packages. But there is no consistency among these programs, and some users, including Herron, say counters should be part of the network operating system.

Also, sometimes licenses are written in legalese, and at times, customer service dictates differ from the written license, Herron added.

"It's the administration of the detail that drives people crazy," Eubanks conceded, agreeing that users are looking for consistency.

Interest in the issue has been building over the past year, given SPA prosecutions and copyright protection debates, Herron said, adding, "I think the industry is ripe for some answers." The raids in particular have created awareness and fear among micro managers, Knepper said.

Mayner said he hopes the white paper will address these issues:

- Licenses: What are they, how should they read, and what should be in them?
- Counters: What is the best approach? Where should they be located?
- Documentation: If you have 100 users and you buy a 40-user concurrent license, you may need anywhere from 100 to 40 copies of the documentation. Should it be decoupled from the license?

NEW PRODUCTS

Software utilities

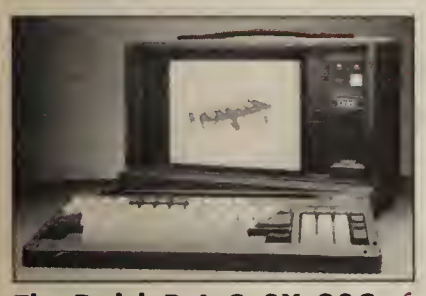
Autosoft, Inc. has introduced Autorun 2.1, its software package for running unattended personal computer applications.

Autorun users create scripts that direct unattended PC functions. The program provides password access such that automatic functions cannot be interrupted by unauthorized users. A "wait until" feature also allows Autorun to search the display and resume interrupted processing when an appropriate text string appears on-screen.

Autorun 2.1 costs $149.95. It runs under the DOS operating system.

Autosoft
Suite 105
1850 Lake Park Drive
Smyrna, Ga. 30080
(404) 436-7144

Systems



The Dolch P.A.C. SX-20C *offers five expansion slots*

Dolch Computer Systems, Inc. has designed a portable computer with five AT/XT-bus expansion slots.

The Dolch Portable Add-in Computer SX-20C, based on the Intel Corp. 20-MHz 80386SX chip, includes a 64K-byte cache, a 40M-byte hard drive and 2M bytes of system memory. The unit weighs 18 pounds. An optional 24,389-color display is also offered.

The base configuration costs $5,995.

Dolch Computer Systems
372 Turquoise St.
Milpitas, Calif. 95035
(408) 957-6575

Board-level devices

The Periscope Co. has designed an adapter that allows its Model IV hardware-aided debugger to operate with the Intel Corp. 80386SX processor.

The Model IV plugs directly into the central processor chip and monitors application performance in real time, permitting software developers to debug time-sensitive and interrupt-driven programs.

The 33-MHz Model IV costs $3,695; lower clock speeds are available. The adapter for the 386SX chip costs $650.

The Periscope Co.
Plaza Level
1197 Peachtree St.
Atlanta, Ga. 30361
(404) 875-8080

Everex Systems, Inc. has unveiled a 32,758-color Video Graphics Array (VGA) card with resolutions up to 800 by 600 pixels.

The Viewpoint Premium card also supports 16 colors at 1,280- by 1,024-pixel resolution. It offers interlaced screen refresh rates up to 87Hz for VGA text modes, noninterlaced refresh rates up to 84Hz for text and 72Hz rates for extended VGA graphics resolutions.

The card costs $299 with 512K bytes of memory. A full 1M-byte version is priced at $339.

Everex Systems
48431 Milmont Drive
Fremont, Calif. 94538
(415) 498-1111

Expanz Plus, a lossless data compression add-in half card for personal computers, has been announced by Infochip Systems, Inc.

The product increases storage capacity by up to three times, according to the vendor. Enhancements over the previous version include 100% data integrity, user transparency and third-party software utility support. The installation menu is also simplified via menus.

Disk accelerator/caching software from Multisoft Corp. is bundled with the card at no additional cost. The price for the Expanz Plus data compression product is $199.

Infochip Systems
2840 San Tomas Expwy.
Santa Clara, Calif. 95051
(408) 727-0514

How to spot the

very best PCs.

It's really quite easy. Just look for PCs that have a genuine Intel microprocessor inside. Either the Intel386,™ Intel386™SX, Intel486™ or Intel486™SX microprocessor.

Intel is the world's leader in microprocessor design and development. In fact, Intel introduced the very first microprocessor. So with Intel inside, you know you've got unquestioned compatibility and unparalleled quality. And you'll know you're getting the very best PC technology.

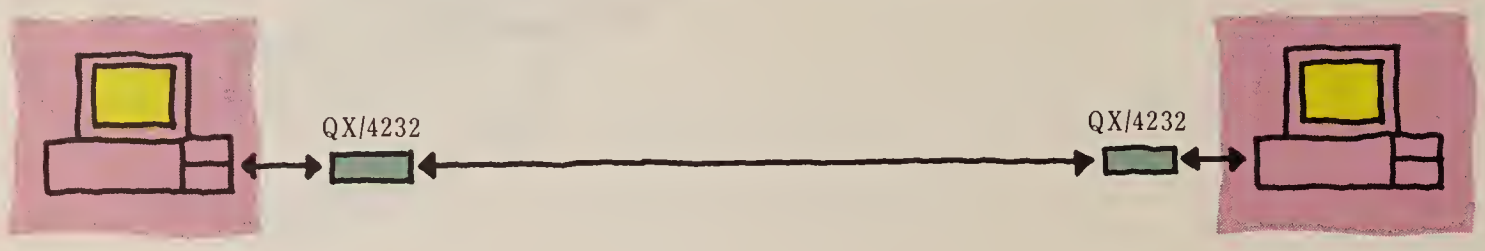
So look for the Intel Inside symbol on ads for leading PCs. It'll show you've got an eye for spotting the best.

intel®

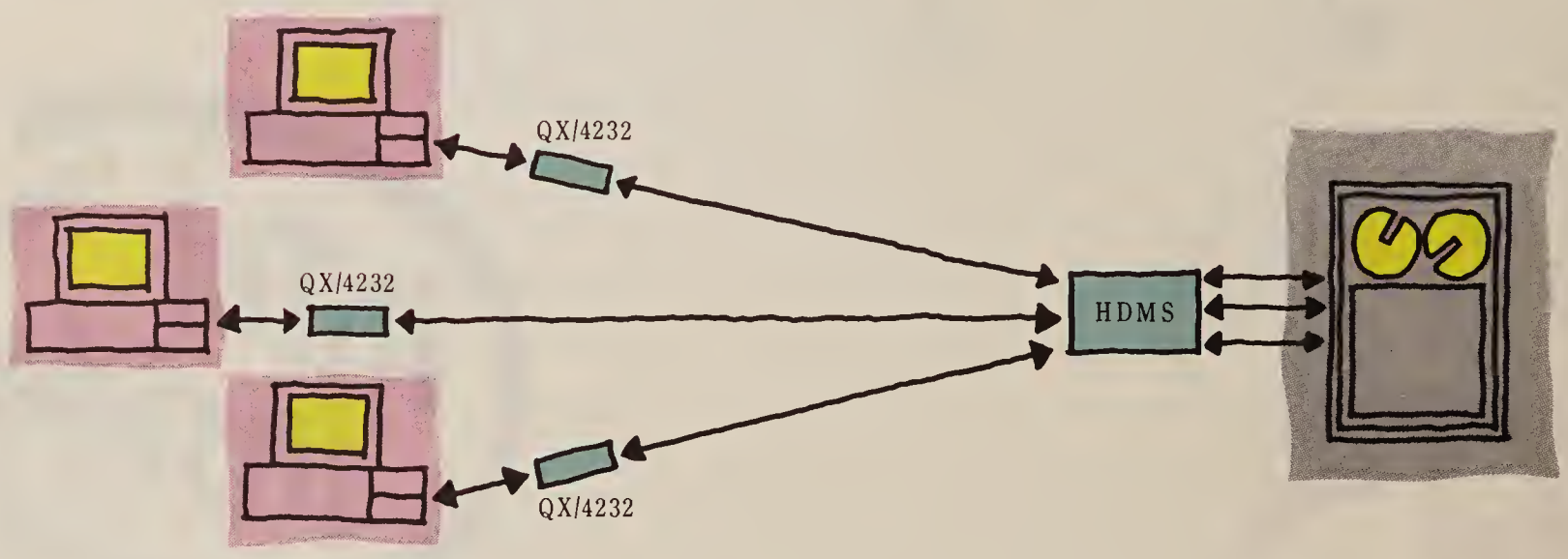
The Computer Inside.™

Intel386, Intel486 and the Intel Inside logo are trademarks of Intel Corporation. All rights reserved. ©1991 Intel Corporation.

Our standalone modems stand out in their class.



Our modem management system is in a class by itself.



Whether you're looking for a high performance modem to provide one-to-one dial-up access to computing resources, or a multiple terminal to mainframe modem management system, Microcom has what you need.

Take our QX/4232hs.™ It provides 38,400 bps throughput with up to 400% data compression and is fully compliant with all existing standards worldwide. That includes CCITT V.32, V.42 and V.42bis.

The QX/4232hs features MNP® 10, the most advanced version of the industry standard Microcom Networking Protocol.™ MNP 10 provides error free data transfer with Adverse Channel Enhancements™ (ACE™) to automatically adjust transfer rates up or down depending upon the line conditions.

Our HDMS,™ is a chassis-based, data center solution that provides unprecedented dial-up network management capabilities as well as proven dial access security.

And it's all from Microcom. The head of its class in price/performance.

Call **1-800-822-8224** today for complete information. We'll send you your choice of Microcom's FREE technology guides on "Microcom Networking Protocol" or "Managing a Dial Up Network." Or complete and mail this coupon to Microcom.

Please send me: ☐ "Microcom Networking Protocol" guide
☐ "Managing a Dial Up Network" guide

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip _____

Telephone _____

C7/15

Microcom

Microcom, Inc., Technology Guides
500 River Ridge Drive, Norwood, Massachusetts 02062-5028
(617) 551-1000, Fax: (617) 551-1021, International Fax: (617) 551-1007

MNP is a registered trademark and Microcom Networking Protocol, QX/4232hs, Adverse Channel Enhancements, ACE, and HDMS are trademarks of Microcom Systems, Inc. © Microcom, Inc., 1991. All rights reserved.

COMMENTARY

Elisabeth Horwitt

Straddling the OSI fence

The same questions have been asked about Open Systems Interconnect for the past five years. Why is it not getting finished quicker? What is keeping users from adopting it faster? Why do major vendors keep saying they will support it fully — in a few years?

Now is a good time to bring up another OSI question that has been asked in the past: Why are DEC and IBM continuing to withhold full support of OSI even as they reiterate their full commitment to the networking standard?

Both IBM and DEC support OSI in the sense that their proprietary systems can communicate with OSI-based systems via a gateway. What both vendors have promised but not delivered is "native" support in their systems. This allows the user to apply OSI protocols directly to initiate programs on a system or have a system talk directly to other OSI-compliant devices.

DEC has provided OSI software for years. However, its promise of fully integrated OSI support on its mainline VMS systems has yet to be fulfilled. Indeed, DEC reportedly told consultants last May that it will provide OSI-compatible Decnet for VMS in another year — or about 20 months late. DEC's PC-to-host system Pathworks will not have OSI support until a year from next May, one consultant reported.

IBM, for its part, brought out the second version of its OSI gateways last September.

The age-old excuse for such behavior is that users still do not yet want OSI and that the standard still lacks functionality in certain key areas, such as directory services. No doubt these arguments are almost as valid as they were last year, and the year before that. However, such an argument begs the question of whether users would be more willing to support OSI if they trusted major vendors like IBM and DEC to throw their weight behind the standard.

While a lot of Fortune 500 companies are attacking their interconnectivity problems with

Continued on page 47

Radio-based nets out of sight

Symbol eliminates cable with spread-spectrum tech, handheld scanners

BY JIM NASH
CW STAFF

Trying to make networks seem invisible to employees using them can give managers fits, but making them physically invisible is actually getting easier. One product aimed at eliminating cabling, the Spectrum One radio-based network, recently began shipping after a year of beta tests.

Two companies that have tested beta versions of Spectrum One from Symbol Technologies, Inc. said they are pleased with its performance and are planning wider implementations of the system. Symbol, based in Bohemia, N.Y., said full release of Spectrum One began in May. Spectrum One is a line of handheld terminal/scanners, networking software and spread-spectrum radio transceivers.

Symbol's Spectrum One *relies on handheld terminal/scanners*

The IBM Personal Computer-compatible terminals combine laser-scanning bar-code readers, alphanumeric keyboards and 20-line displays, according to a Symbol spokesman. Terminals, which resemble guns, read codes and transmit them via radio modems in the 902-MHz to 928-MHz frequency range to bay stations or transceivers. From there, the signal is beamed to a PC network controller, which in turn, sends the data over a Token Ring network to a mainframe.

"Spread-spectrum technology is a strategic direction for us," said Dave Carlson, senior vice president of corporate information systems at K Mart Corp. Narrow-band radio networks are too slow to handle point-of-sale transactions, Carlson said from his Troy, Mich., office.

So far, tests at K Mart have concentrated on automating inventory and price management. Employees use the system to ensure an item's shelf price is consistent with the price being charged at the cash register, he explained.

Symbol said the system can send and acknowledge 125 to 333 network packets each second. Future versions, the spokesman said, are expected to support Transmission Control Protocol/Internet Protocol and Ethernet networks. Systems

Continued on page 50

Communications faces budget chopping block

BY KIM S. NASH
CW STAFF

Voice and data communications budgets are the latest victims of a recession that has ripped into U.S. corporate spending this year, according to a recent survey. Total U.S. communications spending will slide this year to $189 billion, down $3 billion from the $192 billion spent in 1990, said Carol Glasheen, program manager at TFS Comm/Surv, the Westford, Mass.-based market research firm that conducted the study.

Cost shaving is taking several forms, such as more careful chargebacks to a company's divisions and end-user departments and outsourcing some or all communications activities, Glasheen said. The budget model is a compilation of five annual surveys of more than 1,000 U.S. communications managers.

Detailed chargebacks are nothing new at Outboard Marine Corp., said John Plutshack, telecommunications manager at the Waukegan, Ill.-based boating equipment maker. "Our units are run hands-off, so they get billed directly for most of the communications costs they incur," he said.

Outsourcing option

Outsourcing is the answer at Esso Petroleum of Canada, a Toronto-based division of Imperial Oil Ltd. After trying to reduce networking costs for the past two to three years without significant success, the company will outsource local-area network, desktop and data center support, said Bryan Cheater, manager of network services.

Beginning early next year, Esso will farm out most operating and maintenance activities for its entire technology infrastructure to Digital Equipment Corp. and Electronic Data Systems Corp.

"The company is looking to reduce expenses, and there is only so much tinkering we can do internally to optimize costs," Cheater said. Cheater would not speculate on the amount of money Esso will save by outsourcing.

Unlevel funding

After recording several years of growth, communications spending is slipping in 1991

Communication operations budget (excluding government)	
1988	$170 billion
1989	$187 billion
1990	$192 billion
1991*	$189 billion

*Projected

Source: TFS, Inc. CW Chart: Doreen St. John

Not all companies are cutting communications spending. Voice and data budgets at Outboard Marine have not been pinched, Plutshack said. However, he does have a mandate from the executive suite to try to hold expenditures to last year's level, he said. "I have the feeling that if we had planned any major purchases, we would have postponed them," he added.

Less-expensive communications gear — such as lower local and long-distance telephone rates — has also helped Esso stretch dollars. "We can get that equipment at lower prices than last year, so we're spending that savings on other things," he said.

For example, the money that is saved is going toward videoconferencing equipment to offset travel costs between the company's sites in Edmonton, Calgary and Toronto.

The TFS Comm/Surv study found that at just 1%, video is a small percentage of the typical communications budget, compared with data at 49% and voice at 50%.

Little-known Netlabs takes on Cabletron

BY JOANIE M. WEXLER
CW STAFF

LOS ALTOS, Calif. — A little-known manager of heterogeneous data networks crept onto several networking vendors' equipment lists last week. Seven reseller agreements with start-up firm Netlabs, Inc. could propagate an alternative for firms that find the power of Cabletron Systems, Inc.'s Spectrum enterprise manager and its $50,000-and-up price tag to be overkill.

The network and systems management software, called Dualmanager, provides management of multiple vendors' networking devices and systems containing a Simple Network Management Protocol (SNMP) or Common Management Information Protocol (CMIP) agent. Cabletron's Spectrum also manages SNMP devices and will support the Open Systems Interconnect (OSI) CMIP network management protocol during the second half of 1992 when CMIP is better defined, according to Cabletron.

Dualmanager is already being resold by AT&T and reference-sold by Mips Computer Systems, Inc. Netlabs said it added the following vendors to its reseller-only distribution channel: Ascom Gfeller AG; Control Data Corp.; Crescendo Communications, Inc.; Gandalf Technologies, Inc.; Independence Technologies, Inc.; Raycom Systems, Inc.; and Siemens Nixdorf Informationssysteme.

Netlabs is CMIP-compliant today, a marketing necessity for the firm's European clientele that are further along with OSI standards, said Roselie Buonauro, Netlabs' vice president of marketing and sales.

The main difference between Dualmanager and Spectrum is

Continued on page 47

Video gear hot turf in conference competition

BY ELLIS BOOKER
CW STAFF

Last month saw the arrival of new videoconferencing gear, a new competitive force and a promising experimental technology to provide video over ordinary telephone lines.

Compression Labs, Inc. (CLI) rounded out June with a series of major announcements. The 14-year-old San Jose, Calif., vendor of compressed digital video systems introduced a new system that straddles the speeds of its existing video teleconferencing systems, unveiled its latest video compression algorithm and signed an agreement to integrate its systems with those of a vendor of high-bandwidth network controllers.

But CLI gained a new and aggressive competitor last month. British Telecommunications PLC formally announced its entry into the U.S. market, stating its intention to capture 30% of the U.S. market within three years.

CLI's latest coder/decoder, the Rembrandt II/VP, can be configured for data rates from 56K bit/sec. to 2.048M bit/sec. Available in the third quarter, the base hardware system will cost $26,000 and require a $1,500 or a $2,500 line interface; application packages will range in price from $4,000 to $21,500.

> CLI GAINED A NEW and aggressive competitor last month. British Telecommunications PLC formally announced its entry into the U.S. market.

The compression algorithm, CTX Plus, offers high-resolution, near-broadcast-quality video with up to 30 frame/sec. and three times the resolution of low bandwidth schemes, according to CLI.

CLI also announced an OEM agreement with Ascend Communications, Inc. to integrate its system with Ascend's Multiband Bandwidth-on-Demand Controllers. Multiband controllers provide Basic and Primary Rate Integrated Services Digital Network access and T1 access. The controller can also combine individual switched 56K, 64K and 386K bit/sec. switched circuits.

British Telecom said it had invested more than $17 million in the research and development of "visual services products" this year. "The United States is the single largest videoconferencing market in the world, estimated at $1.3 billion in combined equipment and transmission revenue," said Mark Baker, president and chief executive officer of BT North America, Inc. The British Telecom subsidiary, based in San Jose, will be responsible for selling videoconferencing hardware and services.

As part of its strategy, BT North America simultaneously announced two strategic agreements. Motorola, Inc. and BT North America said they will jointly develop new application-specific CMOS gate array chips for future BT North America video products. BT North America also said it had reached an agreement with Philadelphia-based Peirce-Phelps, Inc. to provide nationwide maintenance and integration of BT North America's products.

BT North America might be successful, said Frank Dzubeck, president of the consulting firm Communications Network Architects, Inc. in Washington, D.C. That success may come, however, because users and vendors will move from static, conference room-based systems to desktop systems.

Dzubeck said BT North America's estimation of the money to be made with videoconference products and services is conservative, as is its approach. BT said it is shipping two products designed for conference room use: the VC 2100 for $44,000 and the VC 2200 for $42,000.

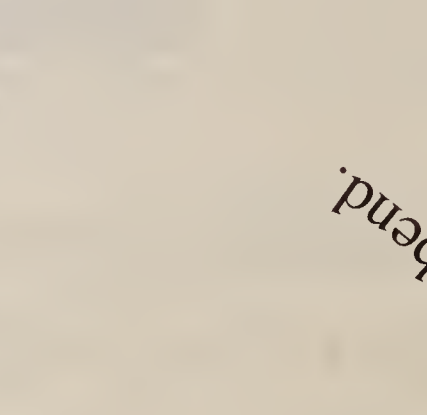
But the market, Dzubeck said, is moving quickly toward multimedia, personal computer-based systems that will create videoconferences at each participant's desktop. Dzubeck said there are already components comparable to BT North America's 2100 and 2200 that cost about half as much. Multimedia technology, which he said should be viable by 1994, will cost even less than those components.

Meanwhile, an experimental technology that allows video cassette recorder-quality television, voice and data to be sent over a single copper telephone line was described last month by Bellcore.

Called asymmetrical digital subscriber line, it combines digital signal processing and experimental very large-scale integrated circuitry. Bellcore said the technology was an outgrowth of its work on High-bit-rate Digital Subscriber Line (HDSL), which provides 1.5M bit/sec. capacity over two copper telephone wires.

Bellcore — the R&D arm of the seven regional Bell operating companies, Cincinnati Bell Telephone Co. and Southern New England Telephone Co. — called HDSL a "viable interim" technology until fiber optics are widely deployed in the "customer loop," that part of the public network connecting a user to a central switching office.

A paper path like this can send reliability around the bend.



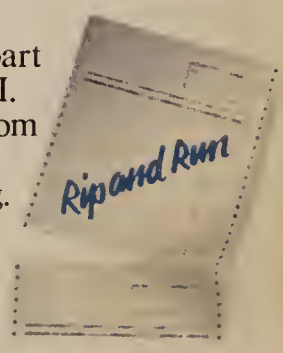
Announcing a design so reliable, it'll have the competition running in circles: the straight paper path of the new IBM Personal Printer Series II dot matrix printers.

Starting with a simpler, no-U-turn paper path, they're engineered from the inside out for smooth, worry-free paper handling.

NO U-TURN

So labels, spreadsheets, thick paper stocks, even six-part forms can't faze a PPS II.

You get front, bottom and rear feeds, all designed for easy loading. And tractors that switch from pull to push in seconds, for rip-and-run efficiency.



And, for about the same price as the leading competitors, PPS II 9-pin printers

THE STRAIGHT-PAPER-PATH,

Horwitt

CONTINUED FROM PAGE 45

a combination of internal programming or multiprotocol routers, a growing number seem to be turning to industry standards as the solution. Aetna and Motorola are among the firms that recently announced major strategies for linking a veritable cornucopia of disparate local-area network, workstation and electronic mail systems. Both said their solutions would be based on standards: in Motorola's case, Transmission Control Protocol/Internet Protocol (TCP/IP) and later OSI; in Aetna's case, to be announced.

Motorola's corporatewide internetworking strategy includes plans to incorporate native OSI support on IBM systems by mid-decade. Meanwhile, the manufacturer has already tested the first version of IBM's OSI Communications Subsystem gateway and sent IBM a list of problems, according to one Motorola IS manager. The company is now in the process of testing IBM's claim that the second version lacks the first version's glitches.

Like DEC, IBM has promised more integrated OSI support in the future.

But it seems likely that both IBM and DEC have their own strategies for "helping" users set up corporatewide multivendor networks. If they simply provide OSI as a way for their systems to act as cogs in a democratic, peer-to-peer network, the two vendors stand to lose their long-standing dominance of the industry and of user installations.

Both IBM and DEC are seeking to maintain that dominance — while upholding their "openness" stance — by developing interconnectivity architectures that can form the basis of corporations' multivendor interconnectivity strategies. Both architectures combine popular industry networking protocols with the vendors' own proprietary application programming interfaces and transport services for tying everything together.

DEC has a slight advantage here, because Network Applications Support has been officially announced and actually has some commercial substance here and there. IBM has yet to announce its own combination of application programming interfaces, transport and access services. However, IBM has long been working on interfaces to allow applications to migrate across Systems Network Architecture and OSI; with TCP/IP and Novell's IPX planned for the future, IBM spokesman Rick McGee tells us. And IBM is expected to announce a client/server architecture this fall that complies with the Open Software Foundation's Distributed Computing Environment and will allow applications to be distributed across its own hosts and Unix servers.

IF IBM AND DEC simply provide OSI as a way for their systems to act as cogs in a democratic, peer-to-peer network, the two vendors stand to lose their long-standing dominance of the industry and of user installations.

These architectures offer one other advantage over straight OSI support — at least to IBM and DEC. They are tool kits rather than complete solutions and generally require the customer to bring in the vendor's systems integration services to help glue everything together.

Horwitt is a *Computerworld* senior editor, networking.

Netlabs

CONTINUED FROM PAGE 45

that Spectrum's artificial intelligence base interprets, draws conclusions and takes action on device statistics. Netlabs' and other vendors' systems report statistics and leave interpretation and action decisions up to the human network administrator.

However, Netlabs' strict focus on network management software is a marketing advantage, according to Brad Baldwin, program director of local-area network vendor research at Gartner Group, Inc. in Stamford, Conn. As a software-only vendor, "Netlabs has no ax to grind; they don't really care who wins the hub or standards wars," he said.

An intelligent wiring hub and network adapter card veteran, Cabletron repositioned itself as a network management company when it rolled out Spectrum last fall. While Cabletron's hardware and cabling reputation is strong, the firm must prove to the market that a low-end networking vendor can also design and support the complex software needed to run large, sophisticated enterprises.

Part of Netlabs' announcement was that Cabletron's major smart hub competitor, Synoptics Communications, Inc., will reference-sell Dualmanager. Synoptics has stated that it intends to continue focusing on the smart hub business.

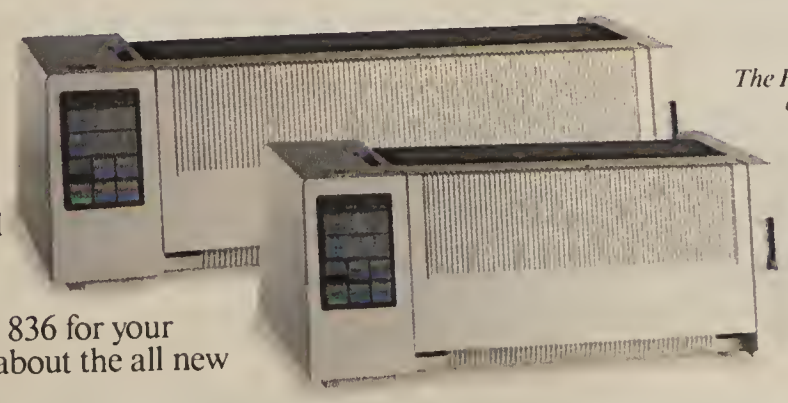
Netlabs' reseller-only strategy "is the posture Netlabs has to take," said Larry Cynar, a senior industry analyst at research firm Dataquest, Inc. in San Jose, Calif. "You wouldn't go to an unheard-of company for network management. A direct end-user sale for Netlabs would be nearly impossible."

Introducing the straight, simple paper path of the new IBM PPS II printers.

deliver 320 CPS in Fastdraft mode, 65 CPS in NLQ, four fonts and six pitches built in, a big 11K print buffer, and a two-year warranty. All wrapped around a beautifully simple, reliable straight paper path.

Call 1 800 IBM-2468, ext. 836 for your nearest dealer, and learn more about the all new IBM PPS II dot matrix printers.

When it comes to reliability, we've dotted every i.



The PPS II 2380 narrow carriage and 2381 wide carriage.

PPS II

A product of Lexmark.

IBM printers are designed and distributed by Lexmark International Inc. under license from International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corporation. ©1991 Lexmark International Inc.

FLAT-OUT-RELIABLE IBM PPS II

Finance Wants To Move Three Hundred Nodes. Last Time It Took Three Weeks. This Time We Have Three Days. All LAN Problems Should Be So Easy To Solve.

Change happens. And in today's business environment, it happens fast.

Let's say, for instance, you're charged with moving a large LAN—clients, servers, bridges, routers, applications, the works. You shut it down Friday night. Move. And the whole thing has to be up and running flawlessly first thing Monday morning.

Piece of cake, right? If you're already working with SynOptics, that is.

Because with our SynOptics LAN Management System you'll be able to systematically plan, validate and troubleshoot any LAN change. Whether you're making a major move or simply adding new users.

Our LattisNet™ hubs spread intelligence throughout your LAN. And our LAN management software lets you take advantage of that intelligence.

For example, before you move your LAN, you can log and profile all network activity down to every port and node. You'll know exactly who's connected to what, which software goes where, and what the traffic patterns are.

SynOptics Communications, Inc., 4401 Great America Parkway, P.O. Box 58185, Santa Clara, CA 95052-8185 © 1991 SynOptics Communications, Inc. LattisNet and "The Hub Of Client/Server Computing" are trademarks of SynOptics Communications, Inc.

Our auto topology feature draws a real time map of what your LAN looks like now. Then, in a fraction of the time it used to take, you can design what you want it to look like after the move.

And when the physical move is complete, you can validate your installation port by port, node by node, in real time. So Monday morning, you can bring the LAN up confident there won't be any downtime.

SynOptics. There is simply no better way to manage your LAN. Or manage change.

For our free video on the SynOptics approach to LAN management, call the number below. And make your next move a smooth one.

Free LAN Management Video, call 1-800-544-1340, ext. 21.

SynOptics

The Hub Of Client/Server Computing.™

Other brand and product names are trademarks or registered trademarks of their respective holders

Radio nets

FROM PAGE 45

Network Architecture gateways are being tested.

Haggar Apparel Co. in Dallas has experienced speed problems with its beta version, but, according to Steve Bernier, manager of Haggar's industrial engineering, the hang-up was in transferring data from the bay stations to the company's IBM Application System/400. Bernier said he is beginning two weeks of tests on a solution.

If response time picks up, he said, Haggar is likely to adopt the system to process bar codes on outgoing cartons. It will automate the way Haggar assigns shipments on different carriers to customers, Bernier said.

K Mart has also used Spectrum One as part of its security system at the test store, requiring the last employee out of a store to scan every door in the building before leaving. Carlson said the system retains a record of each door checked.

As part of its beta test, the company uses the terminal, transmitting to an IBM Personal System/2 Model 50, to send information over its 4M bit/sec. Token Ring network using Netbios. Price and inventory information, Carlson said, is stored in an Informix Software, Inc. database in a Unisys Corp. U6000 Model 65. Inquiries from the terminal take one to two seconds.

NEW DEALS

WTCA pulls Reuters for GEIS net

The **World Trade Center Association (WTCA)** recently chose **General Electric Information Services (GEIS)** to replace **Reuters Holdings PLC** as provider of all communications and computer services to support World Trade Center Network, the association's electronic trading and information system. GEIS was reportedly selected after a request for proposal process involving 15 companies. The switchover from Reuters to GEIS is expected to take place by Aug. 1. The WTCA system will use GEIS' Businesstalk System, which is said to search textual databases, bulletin boards and electronic mail services.

The **Christian Science Publishing Society** has purchased the Lance Network Management System from **Micro Technology, Inc.** for managing and monitoring the company's worldwide network. The system is currently installed in the society's Boston headquarters. Other installations are planned for offices in the U.S. and the UK. The society's network consists of 13 Ethernet local-area networks interconnected by a variety of bridges and routers, which support a wide variety of networking traffic protocols.

Mid-American Waste Systems recently signed up **Scientific-Atlanta, Inc.** to provide a very small-aperture terminal (VSAT) satellite network at a cost of $3 million. One major benefit of using a VSAT-based network for the waste management firm is that new waste sites in remote locations can be linked in a short time, a company spokesman said. The Ohio-based firm is said to operate 38 nonhazardous solid waste landfills and waste hauling companies in 10 states. Installation of the new network is expected to be complete by next month.

Under an $11.6 million contract, **Harris Corp.** will supply a 16,500-line, fiber-optic digital switching system to support the voice and data communications needs of the **U.S. Department of Defense** supply service.

NEW PRODUCTS

Micro-to-host

Pacerterm, a host communications software package for Apple Computer, Inc. Macintosh systems, has been announced by Pacer Software, Inc.

Pacerterm includes an Apple Hypertalk-based scripting language that creates terminal emulation and file transfer tools. It is built around the Communications Toolbox included in Apple's System 7.0 operating system, according to the company.

Pacerterm costs $249.

Pacer Software
Suite 402
7911 Herschel Ave.
La Jolla, Calif. 92037
(619) 454-0565

Xircom, Inc. has designed the Pocket 3270 Adapter for communications between personal computers and mainframes.

The adapter is bundled with Microcom, Inc.'s Relay Gold communications software for DOS ($745) or for Microsoft Corp.'s Windows ($795). It connects to PCs via the parallel printer port and attaches to 3270 controllers.

Xircom
26025 Mureau Road
Calabasas, Calif. 91302
(818) 878-7600

Avatar Corp. has announced Macmainframe 4.0, an enhanced version of its communications software for connecting Apple Computer, Inc. Macintosh systems with IBM mainframes.

Version 4.0 supports Apple's System 7.0 operating system and includes new security features and additional commands for uploading and downloading files.

Low-end hardware and software configurations start at $795. Software-only upgrades from Version 3.0 are free until Aug. 31. Upgrades from other releases cost $195.

Avatar
65 South St.
Hopkinton, Mass. 01748
(508) 435-3000

Attachmate Corp. has announced Extra Extended Version 2.3, a software product for connecting personal computers running DOS to mainframe hosts.

Running under Microsoft Corp.'s MS-DOS 5.0, Version 2.3 implements a modular architecture, allowing large sections of Extra code to be swapped out of main memory while maintaining the micro-to-host connection. In conjunction with the company's 3270 Gateway Option, Extra Extended also supports synchronous Systems Network Architecture communication, enabling users to exchange data with mainframe systems without terminal protocol conversion, according to Attachmate.

Attachmate Extra Extended 2.3 costs $425; the Asynchronous SNA Adapter hardware costs $1,295.

Attachmate
13231 S.E. 36th St.
Bellevue, Wash. 98006
(206) 644-4010

Micro-to-micro

Avalan Technology, Inc. has announced Version 3.0 of Remotely Possible, its remote control software for local-area networks running under the DOS or Microsoft Corp. Windows 3.0 operating systems.

Remotely Possible's Dynamic Link Library intercepts function calls from Windows applications to the Windows Graphics Device Library. According to the company, the product allows user control of Windows systems equivalent to remote control over character-based systems.

An eight-user license costs $299.

Avalan Technology
116 Hopping Brook Park
Holliston, Mass. 01746
(508) 429-6482

Electronic mail

Notework Corp. has developed a Microsoft Corp. Windows 3.0 interface for its electronic mail package.

Notework for Windows works together with the product's DOS interface; the correct interface loads automatically, regardless of which environment the user is working in. It also allows users in mixed DOS and Windows networks to exchange E-mail.

The Notework E-mail package costs $99 for installation and $99 for a two-user license. The Windows interface costs $49 for two users.

Notework
72 Kent St.
Brookline, Mass. 02146
(617) 734-4317

Patrick Townsend and Associates, Inc. has announced a product connecting IBM Application System/400s to electronic mail facilities.

T/Mail allows AS/400 users to direct E-mail to local-area network nodes through Novell, Inc.'s Message Handling System and to IBM Systems Network Architecture Distributed Services network users. It also provides fax capabilities via an interface to Support Net, Inc.'s Fax/401 hardware/software product.

Pricing ranges from $495 to $6,295, depending on AS/400 model and mail options selected.

Patrick Townsend and Associates
423 Maple St.
Mill Valley, Calif. 94941
(415) 388-6536

Jetform Corp. has announced Jetform Email, a software product enabling users to transfer complex forms via existing electronic mail systems.

The product uses forms designed under the company's Jetform Design software. It includes calculated fields as well as input fields, and form designers may specify certain fields as required in order for a form to be transmitted.

Jetform Email is initially offered for Davinci Systems, Inc.'s Davinci Email for Windows. Support for other E-mail systems will be added, Jetform said.

A five-user license costs $795, and a 20-user license costs $2,395.

Jetform
163 Pioneer Drive
Leominster, Mass. 01453
(613) 594-3026

Customer-premises equipment

Fujitsu Business Communication Systems has announced a new software release for its F9600 ISDN platform private branch exchange (PBX).

The Advanced Business Package includes a Basic Rate Interface for Integrated Services Digital Network, a V110 data rate adaption card and a host-to-PBX interface protocol.

Pricing for the package ranges from $5,000 for a software-only upgrade to $60,000 for a hardware and software upgrade.

Fujitsu Business Communication Systems
3190 Miraloma Ave.
Anaheim, Calif. 92806
(602) 921-5900

Cylix Communications Corp. has announced the Cylix M-Range SDLC Data Network Service for IBM midrange systems.

The service provides a turnkey system with network management for modem-to-modem communications under the Synchronous Data Link Control (SDLC) protocol. A number of configurations and data transmission speeds is available, the company reported.

Monthly charges range from approximately $350 to $675 per remote location.

Cylix Communications
Third Floor
800 Ridge Lake Blvd.
Memphis, Tenn. 38120
(901) 761-1177

REXX
For Unix
XEDIT too...
Order uni-REXX and uni-XEDIT today.
800-228-0255
wrk/grp
the workstation group

MANAGER'S JOURNAL

EXECUTIVE TRACK

James E. Godfrey has been named director of communications and information management at Fort Wayne, Ind.-based **Magnavox Government & Industrial Electronics Co.**, a supplier of military electronics.

Godfrey was most recently director of MIS at ITT Corp.'s defense unit in Washington, D.C. In a 21-year information systems career at ITT, his various positions included managing consultant in the IS organization at corporate headquarters in New York and manager of technical services at ITT Telecommunications in Raleigh, N.C.

At Magnavox, Godfrey is responsible for all business data systems development and processing, communications, some engineering computer support, end-user computing and office automation.

He holds a bachelor's degree in mathematics from Grand Canyon University in Phoenix and an MBA from Golden Gate University in San Francisco.

Judy K. Van Alfen has been promoted to assistant commissioner for returns processing at the **Internal Revenue Service** in Washington, D.C.

She succeeds Charles J. Peoples, who was named director of the Austin, Texas, service center. Van Alfen is responsible for planning, developing and directing national programs for the receipt and processing of tax returns.

She was most recently assistant regional commissioner for data processing in the Western Region, a position she held since 1988. She became assistant director of the Austin service center in 1985 after completing the IRS Executive Selection and Development Program.

Van Alfen joined the IRS in 1962 at the Ogden, Utah, service center and worked in several management positions in Ogden, San Francisco and Fresno, Calif.

New system a welcome guest at Hyatt

Migration to Unix allows hotel chain cost savings, quicker business response

BY ELLIS BOOKER
CW STAFF

Almost exactly one year ago, in August 1990, Hyatt Hotels Corp. completed the most ambitious step in its migration to Unix: replacing its central IBM mainframe-based reservation system with a relational database management system on multiple Unix processors.

By all counts, Hyatt rates the strategy a success. The Chicago-based hospitality chain has brought business applications to a fruition that it had tried and failed to realize under the old architecture; it has saved money and achieved better response time. Last month, Hyatt put the classic corporate stamp of approval on the migration — it rewarded the two information systems executives responsible for the implementation.

In explicit recognition of the strategy's success, Gordon Kerr was promoted to senior vice president of MIS. Kerr's second-in-command, Dan Amedro, took Kerr's old slot, moving up to vice president of MIS from assistant vice president.

David Joel

Hyatt's Kerr (left) and Amedro *have a lot to smile about: successful Unix implementation and executive promotion*

Unix only part of the plan

It was more than Unix, however, that advanced both men's careers. It was under Kerr and Amedro's watch that Hyatt moved along several strategic IS fronts. Not only did Hyatt exchange the proprietary operating system it had used since 1982 for Unix, it also switched from customized software to a commercial RDBMS and moved from a proprietary to nonproprietary wide-area network.

So far, the new reservation system has resulted in more than a 20% cost savings over the old system, which cost $7 million to $8 million per year in leasing fees and maintenance.

But "saving money per se" was never the primary goal, according to Kerr, who stresses that the greatest benefit of the new hardware and software platforms is allowing Hyatt to "respond quickly to changes in the marketplace."

Insiders such as Kerr know that the hospitality industry, which may be all prompt service and smiles at the check-in desk, is actually brutally competitive, with margins made all the thinner by the recession and the decline in business and personal travel.

An example of quicker response is Hyatt's "1-800-CHECKIN" service.

The service, which rolled out last November, lets a guest confirm a room reservation and even get a room number by calling an 800 number.

Behind the scenes, the 800 system works this way: Phone operators at Hyatt's Omaha location field the call and then log on to a specific Hyatt hotel's computer over the company's one-year-old Transmission Control Protocol/Internet Protocol network.

Earlier, Hyatt had tried and failed to bring out the same kind of service with

Continued on page 52

Applying behavioral science to IS

BY CLINTON WILDER
CW STAFF

What do macaque monkeys in Bermuda and chimpanzees in Zaire have in common with your average information systems staff?

They both make excellent subjects for behavioral science observation.

Say what?

Okay, the analogy is a little bit exaggerated. But Cathy Walt, an anthropologist with a Ph.D. in behavioral science, applies her unusual training as an IS management consultant. Companies interested in Walt's offbeat approach to IS management challenges include Merck & Co., Meridian Bancorp, Inc. and McNeil Pharmaceutical. For the past year, Walt has worked as an industry specialist with CSC Partners, the IS consulting subsidiary of Computer Sciences Corp.

"A lot of IS people thought it was hocus-pocus at first, but now I'm getting calls from major companies doing re-engineering," said Walt, who is based at CSC Partners' office in Wayne, Pa.

"Anthropology is the study of cultures, and business is just another culture."

Among Walt's presumptions is that the success or failure of a systems development team or project depends more on the behavioral skills of the participants than their technical skills. And the success of re-engineering critical business functions depends first and foremost on changing behaviors.

"We talk about flattening organizations, but if you look at primate societies, that goes against the culture," she says. "A hierarchy is supposed to be established. Getting an IS group to understand that the hierarchical boundaries go away is a very difficult thing to do."

Overcoming barriers

By matching employees' behavioral skill sets with others to form effective teams, Walt has helped knock down some of those boundaries. At Meridian, a $12 billion bank in Reading, Pa., Walt helped employees migrate to a distributed environment that allows users to send letter-of-credit applications directly from their workstations.

She has also been hired to help clients figure out what cultural barriers prevented a new technology from doing what it was supposed to do.

"Some people accuse me of overanalyzing them," Walt said, "but I just take note of things that other people don't."

Welcome guest

CONTINUED FROM PAGE 51

its Transaction Processing Facility (TPF)-based reservation system and IBM Systems Network Architecture WAN.

The reservation system, located in Hyatt's Oak Brook, Ill., data center, now has four AT&T System 7000s — the reduced instruction set computing servers built for AT&T by Pyramid Technology Corp. — where an IBM 4381 mainframe once stood.

Hyatt also moved from IBM's TPF, a 24-year-old on-line transaction processing environment, to a relational database from Informix Corp.

But these moves were just the boldest steps in a migration to Unix that began at Hyatt in 1988, when the company began placing AT&T 3B2 Unix servers in its hotels. "Frankly, the 1988-1989 time frame was when we learned that we had a lot to learn," Amedro says.

He notes that the staff "didn't know how to administer remote Unix machines . . . and didn't know how to distribute code and recover remote machines" that failed.

AT&T had things to learn, too, Amedro said. "I'm not sure they were used to running 7 x 24 mission-critical applications," he said, referring to a seven-day-per-week, 24-hour-per-day transaction processing environment. "We both went through some pain in that first year."

Now, with the hotel systems fully deployed and an in-house, Unix-trained staff of 10, the delivery time for new applications has been sharply reduced. "We can write code for the field and in two hours have it in every property," Amedro says.

Early decisions were key

For all of its technical merits, however, the Unix strategy might not have been successful had it not been for two early decisions. Aware they were forging new territory, Hyatt's IS team and top management insisted on a relationship with principal vendors AT&T and Informix that went beyond the traditional hardware and software sale.

"I told them we didn't want to bet the ranch," says John Biggs, Hyatt's senior vice president of accounting and administration, and the man credited with pushing the vendor strategy [CW, Sept. 24, 1990].

In practical terms, this meant a much closer working relationship with vendors than Hyatt had demanded in the past. Meetings between senior executives from Informix, AT&T and Hyatt occurred every six to eight weeks. Within the so-called partnerships, however, it was still up to Hyatt to keep the vendors in line and insist that the system met up with expectations.

For instance, a benchmark of the

A pioneer with arrows

Although Hyatt was not the first major hotel chain to try an alternative to a classic mainframe-based reservation system, it might be the most successful pioneer to date.

Take the case of Hyatt competitor Howard Johnson Franchise Systems, Inc. in Wayne, N.J. It ran into snags four years ago when it attempted to move its central reservations to a fault-tolerant system from Stratus Computer, Inc.

Howard Johnson "wanted to find a technological advantage, a niche, and four years ago, Unix wasn't an option," explains Douglas L. Patterson, senior vice president at the reservations services division of Hospitality Franchise Systems, Inc. (HFSI) in Phoenix.

HFSI, formed last July, operates the Howard Johnson and domestic U.S. Ramada Inns, Inc. franchises. HFSI does not own or operate any hotels but provides a variety of services, including central reservations, IS and telecommunications to the two chains, which together have about 1,000 properties.

Plans to bring Ramada's reservation system — an IBM 4341 mainframe running IBM's TPF software — to the Stratus platform were scrubbed last year because of delays and difficulties in adding functions to the Howard Johnson system.

What's more, Patterson says, the fault-tolerant features of the Stratus equipment, which involves the expense of redundant hardware and software, are not even being used. "We just found we don't need that level of fault tolerance," he says.

But Patterson is not content with the status quo by any means, and he recently put out a request for proposals to vendors for a new and likely Unix-based reservation solution for both the Ramada and Howard Johnson systems. He said he hopes to have a vendor for the $5 million to $7 million contract by mid-fall.

Still, "it was gutsy four or five years ago," he says. He credits his predecessors for having seen that proprietary on-line transaction processing schemes "might not be the be-all and end-all of transaction processing."

ELLIS BOOKER

1975 *Launched the first U.S. public data network.* 1979 *Built the first commercial private packet network.* 1980 *Introduced the first major public e-mail service.*

MADE FOR ITALIAN SPORTS CARS.

1988 *Sprint completes the only nationwide 100% digital fiber optic network. Sprint awarded 40% of FTS 2000 contract.* 1989 *World's first and largest privately-owne*

reservation system run a few months before the system was to go live showed a 15-sec. response time. After insisting that the hardware and software vendors figured out how to improve the performance, the system was able to hit the target mark of an under-2-sec. delay for 95% of all transactions.

Equally important and complementing these external relationships was the backing of Hyatt President Darryl Hartley-Leonard. "Darryl really never wavered," Kerr says. "I think if he had, the whole thing would have come to a grinding halt."

Hartley-Leonard did more than blindly back his IS group, however. On occasion, when hotel managers voiced concerns about how the Unix systems project was going and how it might reduce their managerial autonomy, he brought the two groups together to air complaints and concerns. Attendees at the meetings remember them as "brutally honest" and sometimes uncomfortable but immensely valuable.

Looking back, Amedro says the appeal of Unix was twofold. First, systems can be deployed rapidly. Just as important, however, the environment is scalable, "so you can use [the same application] for very small operations with a couple of terminals to a hotel with 3,000 rooms and 100 terminals," he says. In addition, a common systems approach makes it far easier to transfer management around the company's many properties.

But Hyatt's IS executives remain realistic about the "ease" of Unix and open systems. Kerr says, for example, that "it wouldn't be worth the integration hassles" to consider linking a new, non-Informix database to his central reservation system. "Unix similarity is trivial compared to database dissimilarity." However, Kerr says he is open to the idea of stand-alone applications based on different, even proprietary hardware.

What is on Hyatt's future IS agenda? Both Kerr and Amedro talk about getting closer to Hyatt's travel agents to provide better service to Hyatt's ultimate customer, the traveling public. Currently, some 110,000 travel agents worldwide make Hyatt reservations through what the hotel industry calls a "Type B" interface, meaning the agents use the computerized reservation systems of the airlines and receive only approximate information about the availability of a Hyatt hotel room.

Far better is a "Type A" interface, whereby agents can view real-time data on the Hyatt systems. Three months ago, Hyatt established just such a link with Sabre, the customer reservation system of American Airlines, and System One, the reservation system used by Continental Airlines.

The airline systems are connected to Hyatt via The Hotel Industry Switch Co. in Dallas. The company, also an AT&T System 7000 user, is providing an interface between airline systems and hotel chains, which must now attach to each customer reservation system separately.

1985 *Sprint introduces the world's first VPN.℠* 1986 *First transcontinental fiber optic call transmitted by Sprint.* 1987 *Eight million FONCARDs℠ distributed in first year.*

MADE FOR DATA.

These days, companies are finding all kinds of new ways to stay ahead of the competition. LAN internetworking. Group IV faxes. High-resolution imaging. And videoconferencing. All of which call for sending huge blocks of data at high speed.

That's why you should take a close look at the Sprint® network. It has 100% digital switches. And 100% fiber optic transmission. Nationwide. So it's easy to add bandwidth as your applications grow.

But no matter how fast we go, this is the safest decision you'll ever make. From the ground up, we designed the whole network for data. And it's backed by 24-hour support. So it gives you the reliability you need for critical applications. And the best medium for error-free transmission.

If you'd like to know more, call 1-800-729-3418. We'll have detailed information in your fax machine. And we'll get it there a lot faster than you can imagine.

Sprint®
Made for data.™

© 1991 US Sprint Communications Company Limited Partnership

transatlantic fiber optic cable completed. 1990 *Sprint announces the first commercial video services to the Soviet Union. Sprint introduces first nationwide ISDN capabilities.*

MANAGEMENT SHORTS

Dahl-Morrow on West Coast

Dahl-Morrow International, an executive search firm specializing in interim management assignments, has opened a West Coast office in Mill Valley, Calif. Headquartered in Bethesda, Md., Dahl-Morrow appointed Peter Hickey to head the office as executive director of West Coast operations.

Founded last January, Dahl-Morrow plans to open three other offices this year. Its target industries for having the most need for interim management are high technology, finance, health care, communications, publishing, law, insurance, defense, real estate and broadcasting.

The job market for **information systems executives in Southern California** is starting to improve after reaching a very low point, according to one Los Angeles-based IS consultant who tracks the market.

M. Victor Janulaitis, president of Positive Support Review, Inc., said the region experienced a 10% unemployment rate among chief information officers earlier this year. "At the low point, three to five CIOs a week" were calling him asking about available jobs, Janulaitis wrote in a recent newsletter.

Southern California industries that are bouncing back fastest in IS hiring for the short term are entertainment, health care, financial services and manufacturing. The defense industry, however, continues to offer poor prospects for both the short term and long term, according to Janulaitis.

Ouellette & Associates, Inc. in Bedford, N.H., has appointed Margaret E. Schubert as manager of consulting services. She has specialized in systems analysis, design, installation, training and change management in banking and financial securities information systems departments and at a Big Six consulting firm.

CALENDAR

AUG. 11-17

Manufacturing Networks Conference. Chicago, Aug. 12-13 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Windows and OS/2. Boston, Aug. 14-16 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5000.

AUG. 18-24

Share 77. Chicago, Aug. 18-23 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

MIS Training Week West '91. San Francisco, Aug. 19-23 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

The Santa Cruz Operation Forum '91. Santa Cruz, Calif., Aug. 19-23 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

Fed Micro. Washington, D.C., Aug. 20-21 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

AUG. 25-31

Surface Mount International Conference and Expositon. San Jose, Calif., Aug. 25-29 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

International Security Conference. New York, Aug. 27-29 — Contact: Cahners Exposition Group, Des Plaines, Ill. (708) 299-9311.

Database and Expert Systems Applicotions. Berlin, Germany, Aug. 28-30 — Contact: Dimitris Karagiannis, Ulm, Germany (011-49) 37-150-1540.

Advanced Communicotions Technology Satellite Program. San Jose, Calif., Aug. 29-30 — Contact: Mary B. Gibbs, Public Service Satellite Consortium, Arlington, Va. (703) 979-0801.

SEPT. 1-7

Very Large Data Bases. Barcelona, Spain, Sept. 3-6 — Contact: VLDB '91-Difusora de la Informatica, SA, Barcelona, Spain (011-34) 3-418-8067.

HD World. San Francisco, Sept. 4-6 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

Unix Open Solutions '91. San Jose, Calif., Sept. 4-6 — Contact: Unix Open Solutions '91. Needham, Mass. (617) 449-8938.

SEPT. 8-14

Managing the Move to Workstation-Based Development — The Wave of the '90s. San Diego, Sept. 8-11 — Contact: Development Center Institute, Inc., Indianapolis, Ind. (317) 846-2753.

Disaster Recovery Symposium ond Exposition. Atlanta, Sept. 9-11 — Contact: Disaster Recovery Journal, St. Louis, Mo. (314) 846-1001.

Symposium on the Computerization and Use of Materials Property Data. Cambridge, England, Sept. 9-11 — Contact: Teresa Cendrowska, ASTM, Philadelphia, Pa. (215) 299-5546.

Digital Equipment Computer User Society (DECUS) Europe Symposium. The Hague, Sept. 9-13 Contact: DECUS Europe, Petit-Lancy, Switzerland (011-41) 22-709-4264.

Data Storage. San Jose, Calif., Sept. 10-12 — Contact: Forum Management, Cartlidge and Associates, San Jose, Calif. (408) 554-6644.

Dawnsizing Expo. Los Angeles, Sept. 10-12 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Government Neural Network Applicotions Workshop. Huntsville, Ala., Sept. 10-12 — Contact: Rene Kirkwood, U.S. Army Research Office, Research Triangle Park, N.C. (919) 549-0641.

Information Highways: Linking Americo for Interactive Communications. New York, Sept. 11-12 — Contact: Business Week Executive Programs, New York, N.Y. (212) 512-2184.

ABCD: The Microcomputer Industry Associotion's Breokoway '91 Conference. Atlantic City, Sept. 11-13 — Contact: Deborah Keating, ABCD, Ridgeland, Miss. (601) 977-9033.

Info MIS, The Information Management Exposition and Conference. New York, Sept. 11-13 — Contact: Leslie Livingston, Cahners Exposition Group, Stamford, Conn. (203) 352-8443.

SEPT. 15-21

International Electronics Packaging Society (IEPS) Conference. San Diego, Sept. 15-18 — Contact: William Ashman, IEPS, Wheaton, Ill. (708) 260-1044.

Data Administration Management Association International Symposium. Seattle, Sept. 16-17 — Contact: Bill Harenburg, Triadigm International, Los Angeles, Calif. (213) 622-00123.

Effective Methods for Information Systems Quality Assurance. Orlando, Fla., Sept. 16-18 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Auto-Tech '91. Detroit, Sept. 17-19 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

CASE Conference: Rebuilding for Software Automation with the 4Rs of CASE. San Francisco, Sept. 17-19 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

The SYSTEMS 91 will be the forum for all important domestic and international companies to present their latest and most fascinating products. Whether in **computer technology** or **communications technology**, **software**, **services** or the comprehensive range of **system components**, **OEM** products and the latest **network technology**, Europe remains the No. 1 growth market. The SYSTEMS brings the state-of-the-art to you – in the form of a trade fair and congress. And this year, for the first time, the SYSTEMS has been extended for one day. 5 + 1 days = 1 day more for that extra piece of information. For that extra contact. For the SYSTEMS + Munich.

5 + 1 DAYS

COMMUNICATION

SYS SYSTEMS 91

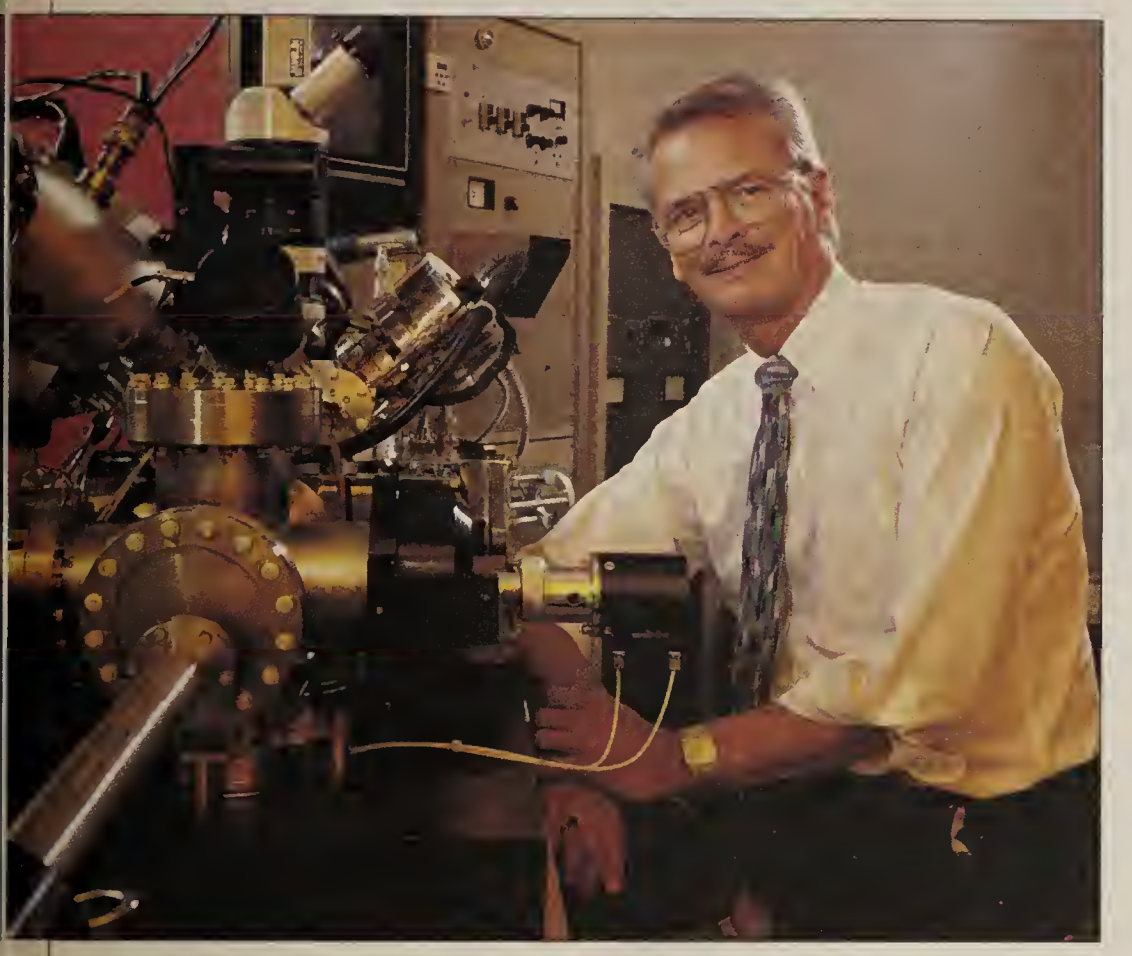
Computers and Communications
12th International Trade Fair and International Congress
Munich, October 21-26, 1991
Saturday is Systems + Munich

Information: Kollmon Associates
5 Mople Court, Ridgewood, NJ 07450
Tel. (201) 652-7070, Tfox (201) 652-389
or, from September 16, 1991
our speciol telephone information
service in Munich on 89/260 58 82.

MESSE MÜNCHEN INTERNATIONAL

Rip it up!

Re-engineering is the season's hottest buzzword. What's behind all this talk about obliterating, anyway?



John Gilroy

Dow Chemical's Huppertz: *To successfully re-engineer, 'you need to have all of the players involved' — especially top managers*

BY JULIA KING

"Don't automate, obliterate." "Business as usual is killing us." "Rip it up." Most information systems executives will instantly recognize these battle cries of industry's latest fascination: re-engineering, a.k.a. business process redesign.

Recession, heavy foreign competition and a desperate ongoing search for making technology investments pay off have helped make re-engineering the IS buzzword of the early '90s. "Re-engineering is a popular word right now," says Hans Huppertz, Dow Chemical Co.'s IS director.

That's an understatement. IS managers today can scarcely go to a conference or read a technology publication without hearing re-engineering hailed as the savior of U.S. competitiveness. Poll after poll has shown high interest among IS executives (see chart page 57), thanks to evangelists such as CSC Index, Inc. and Michael Hammer, the Cambridge, Mass., consultant whose name has become synonymous with the concept.

Re-engineering aims to use the power of information technology to radically redesign business processes to improve speed, service and quality. By not "paving over cowpaths," proponents say, companies can also hope to enjoy payoffs from their large investments in information technology.

But for all the talk, re-engineering has yet to make practicing converts of most IS managers and senior business executives. Some organizations have hired consultants to educate them about re-engineering. Others have begun evaluating existing business processes, ranging from accounts payable to inventory management. But the list of companies that have actually executed full-blown re-engineering programs numbers only in the dozens.

Ford Motor Co., Mutual Benefit Life Insurance, AT&T and Digital Equipment Corp. are the most widely publicized examples of companies that have taken the plunge. Bristol-Meyers Squibb Co., Abbott Laboratories, Westinghouse Electric Corp., Kentucky Fried Chicken Corp. and others have also recently embarked on re-engineering projects.

"The organizational changes involved in re-engineering are both wrenching and difficult," says Tom Davenport, a consultant at Ernst & Young in Boston and author of a 1990 *Sloan Management Review* article on the topic. "Even in the success stories, it takes time. I don't know of any that took less than two years."

Cost is also a factor. While companies are often highly secretive about re-engineering expenses, bills for consultants and internal costs can reach seven figures — and often, much more.

Then there is the risk to IS managers themselves. "Re-engineering can be healthy or unhealthy for an MIS career," says Alan Ditchfield, the former MCI Communications Corp. IS chief who is now senior vice president of information services at The Progressive Corp. The insurer recently completed a five-year re-engineering effort (see story page 58).

> "RE-ENGINEERING is not a fad."
>
> GARY GULDEN
> CSC INDEX

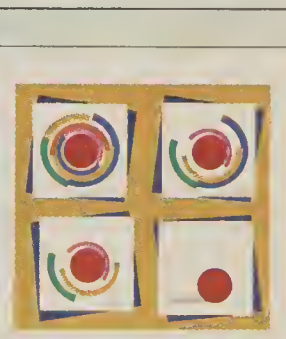
Like every other prescription for salvation, re-engineering has attracted its share of skeptics. Some contend that the concept amounts to little more than old wine in new bottles, a gimmick created by consultancies to sell services.

"There's not a great deal new here," says Jon Turner, director of the Center for Research on Information Systems at New York University. "Enlightened companies have always injected questions about work flows early in the process."

Of the growing number of consultancies offering re-engineering services, he says: "People who write in leading-edge journals are always looking for ideas that are flashy. That's what sells

Continued on page 56

King is a free-lance technology writer based in Ridley Park, Pa.



Re-engineering

KEY POINTS

▶IS interest in re-engineering is high, but relatively few companies are undertaking major projects. The major obstacles are high costs, long timetables and the newness of the idea.

▶Top managers are also an obstacle: A CSC Index poll showed that most senior business managers don't link re-engineering to competitive gain (see chart page 57).

▶IS professionals can introduce the idea of re-engineering to their companies, but they are not well-positioned to drive re-engineering efforts.

▶Consultants are not necessary to do re-engineering, although users say outsiders can help drive the process, especially in attracting support from management (see story page 56).

▶The Progressive Corp. has undertaken a $28 million re-engineering project that brings company vans to accident scenes (see story page 58).

▶QUOTABLE:

Re-engineering [leaders] "either will become the company's next CEO or will be out on the street."

Tom Davenport
Ernst & Young

Continued from page 55

consulting" to businesses.

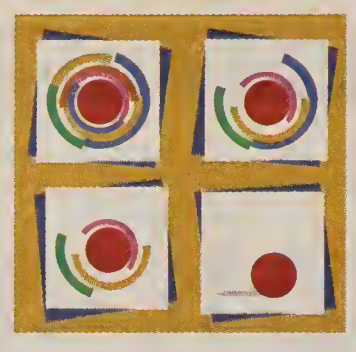
"There are some situations where consulting firms are selling the same old stuff under a new wrapper," Dow Chemical's Huppertz adds. But, he says, he sees value in the process nonetheless.

The Midland, Mich., company recently revamped its customer service process, consolidating six customer service centers into one. The company now plans to consolidate operations at more than 20 separate data centers into one centralized location. "We're trying to come to grips with what it means," Huppertz says.

Another word for quality

Ditchfield says he views the process as a variation of another popular idea. "It's really a quality process; it's figuring out a way to bypass all the crap and do something new."

Bill Stoddard, a managing partner at Andersen Consulting in New York, concedes that the idea of analyzing and then streamlining business processes before automating isn't exactly novel. It can be traced back to what are now well-established practices in the manufacturing community, such as the just-in-time delivery popularized by the Japanese.



Benjamin Porter, a consultant at DMR Group, Inc. in Boston, agrees, noting that re-engineering is simply industrial engineering concepts applied to a nonfactory environment.

However, having roots in earlier ideas doesn't necessarily invalidate the concept, proponents staunchly maintain.

"Re-engineering is not a fad," insists Gary Gulden, an executive vice president at CSC Index, the Cambridge, Mass., consultancy credited with coining the term.

"The merger and acquisition binge has left companies loaded with debt, and many companies are facing stiff competition from the Japanese," Gulden says. "Re-engineering is rooted in American companies' very real need for breakthroughs."

"Companies with problems to solve invented re-engineering," Ernst & Young's Davenport adds. (Not surprisingly, banks and insurance companies show the greatest interest in the approach, according to several polls.) Then, Davenport continues, consultants and academics jumped on the bandwagon when it looked like there was money to be made."

What is new, Gulden and others say, is the radical nature of the change. Unlike the missionaries of quality who preceded them, today's re-engineering evangelists — largely academics and management consultants — spurn steady, incremental gains in favor of a corporatewide revolution that yields dramatic results.

Instead of revamping or improving existing systems, re-engineering focuses on tearing things down and looking with a fresh, technology-oriented eye, explains Andrew Weiss, a consultant who has worked on re-engineering projects at Nolan, Norton & Co. and the Federal National Mortgage Association.

Also new, proponents say, is the slowly growing support of nonmanufacturing senior executives in areas such as administration, finance and sales and marketing.

Businessside push

At Minneapolis-based Datacard Corp., for example, the push to re-engineer the company's customer service operations came from its sales organization.

The previous strategy for servicing the company's terminal products was to replace old units with new ones, then send the old ones to a depot for repair, explains Mike Thorsen, Datacard's chief information officer and vice president of quality. Customer service representatives manually logged in and edited all incoming information before dispatching a technician.

It usually took a few hours to a full day as well as five telephone calls between service representatives, technicians and customers to get the job done, Thorsen says. Salespeople complained.

Do you really need a re-engineering consultant?

BY JULIA KING

Information systems managers who are thinking about trying re-engineering may ask themselves: Do I really need a consultant? The answer is no, according to IS executives who have re-engineered. But both say enlisting outside professionals can help the process move more smoothly.

Most importantly, they say, consultants can play a key role in convincing senior management that change is necessary. Beyond that, says John Collins, vice president of MIS at Hallmark Cards, Inc. in Kansas City, Mo., outside help can play a key role in motivating managers to keep what he calls "the elevated point of view.

"It's easy to slip back to the old way of doing things rather than reaching for the stars," Collins says — especially when many employees are bent on maintaining the status quo. "Consultants keep you stretching." He jokingly adds: "They also give you somebody to hate as you're going through the process." For his company's re-engineering project, Collins brought in CSC Index, Inc.

Gulden: *Expect to invest seven figures*

Hans Huppertz, director of IS at Dow Chemical Co., has hired Andersen Consulting. He says consultants are helpful sounding boards for ideas generated by a company's managers.

Cultural change

"Re-engineering means a cultural change for the company," Huppertz says. "You spend a lot of time bringing end users and customers along in the process. You give thousands of presentations. One way to do this is to use [consultants] for training and to promote awareness."

Mike Thorsen, vice president of quality and chief information officer at Datacard Corp., says, "There's a tendency for MIS to more easily see the way things can be changed, but it's a wasted effort unless key management buys in right away."

A do-it-yourselfer, Baxter Healthcare Corp., following a 1985 merger with American Hospital Supply, combined its accounts receivable, accounts payable, credit, collection and payroll functions into a centralized shared services department in 1989.

The years in between were spent learning and planning, says Ergin Uskup, Baxter's vice president of corporate information services. Rather than use consultants, Uskup says, Baxter looked at other companies — specifically General Electric Co., which had adopted the shared services concept — and decided it was feasible to do the job itself.

Concrete evidence

Del Henderson-Langdon, director of work systems consulting at DMR Group, Inc. in San Francisco, says a crucial part of keeping managers and workers motivated during re-engineering is providing concrete evidence of gains achieved at other firms.

For example, when working with a client, Henderson-Langdon might mention that she consulted at Citibank NA. After DMR helped Citibank re-engineer a credit analysis system, the time its employees spent recruiting new business instead of tidying up paperwork from completed deals jumped from 9% to 43%, while profits soared by more than 750% over a two-year period, she says.

"We can show people in quantitative ways what they can achieve," Henderson-Langdon says. "By doing this, you get management buy-in."

Another way in which consultants can help is to prescribe tested ways of accomplishing re-engineering goals.

Andersen Consulting employs a so-called 10X re-engineering formula. This was designed to reduce by 90% the difference between the best practice in a particular industry and what a company may be doing today, says Bill Stoddard, an Andersen Consulting managing partner in New York.

"If a company's lead time to process an order is 12 days, and the best practice in the industry is two days, 10X says to cut the different by 90%, taking the 12 days down to three days," Stoddard explains.

On the whole, Stoddard says, both the 10X formula and the re-engineering process are "very straightforward." The difficulty is in working with people, he says. Stoddard notes that teaching employees to perform newly defined jobs requires training programs. Also, ongoing persuasion is needed to convince workers that the new way of doing things is indeed better than the old way, he adds.

Davenport: *Keep control of project*

While consultants can do a great deal to motivate and train employees, Tom Davenport, a consultant at Ernst & Young, says they cannot and should not lead the firm's re-engineering efforts.

"Consultants can bring a broader view of what is going on in other industries, but as soon as it looks like the project is the consulting firm's project and not the company's, it is doomed," he says.

Consultants don't come cheap. According to Gary Gulden, a CSC Index vice president, companies should expect to make "a seven-figure investment" in consulting for a two- to three-year project.

At DMR, Henderson-Langdon pegs the cost of re-engineering consulting at between 5% and 7% of the overall projected benefit. Andersen says project costs can range from a few hundred thousand dollars to $50 million. However, Henderson-Langdon says, clients can expect these costs to decrease eventually as IS managers, now on a learning curve, begin to play a larger role in the process. •

Temple of boom

If Michael Hammer is the high priest of re-engineering, mecca is a 13-story modern brick building in Kendall Square.

In April, Hammer & Co. and CSC Index established a joint re-engineering center in Cambridge, Mass. Through public and private seminars and other means, the center aims to educate business and IS managers about re-engineering and to help companies initiate their own projects.

The two companies have also launched a multiclient research and advisory service, The Quantum Project, to study how companies go about accomplishing radical organizational and business process changes. Sponsorship is limited to 40 organizations.

The center, however, is not a vehicle for re-engineering consulting, which both companies offer under separate services, says Gary Gulden, a CSC Index vice president.

Ken Krebs

Hammer: *High priest gets pulpit*

Now, Datacard customers call a central dispatch center, where service reps already have on-line all pertinent data about a customer's equipment. Following the call, all information is relayed to technicians equipped with pagers. The technicians are immediately dispatched to the customer site.

Thorsen credits the change with helping Datacard's sales grow from $50 million to more than $350 million.

"To be successful at this, we had to look back at the why of things, at the reasons for the process in place," Thorsen says.

> "IT'S DIFFICULT in the absence of a crisis for an organization to mobilize itself. The fact is that if the wolf isn't at the door for many companies, they can't get unstuck."
>
> GARY GULDEN
> CSC INDEX

Lack of clout

Re-engineering advocates in IS find themselves in a tricky position, however: On the one hand, computer professionals are well-positioned to understand the dramatic, technology-driven changes that are possible through re-engineering. Yet in most organizations, IS lacks the clout needed to get things rolling.

For that reason, consultants and IS executives alike say technology groups cannot (and should not) have the main responsibility for re-engineering projects.

"IS is uniquely situated with having an overall view of a company," Andersen Consulting's Stoddard says. "But there is a credibility gap because IS has traditionally applied technology to existing business practices and locked in the old inefficiencies of those practices."

CSC Index's Gulden agrees. He says IS has "learned the hard way that they can't lead the charge through technology. They see that work must be redesigned and behavior must be changed, which requires leadership from above."

At Dow Chemical, customer service jobs changed radically after re-engineering, and only senior management is in a position to make such changes, Huppertz says. "You're building a system that is a process that crosses functional boundaries, and you need to have all of the players involved," he says.

IS nonetheless has a big contribution to make by getting the ball rolling and providing the methodology for implementing change, says John Collins, vice president of MIS at Hallmark Cards, Inc. in Kansas City, Mo.

Collins brought in CSC Index consultants to learn more about implementing re-engineering principles.

Once his group had introduced senior management to the concept of re-engineering, IS took a background role. "IS isn't in a position to turn the whole company around," he acknowledges.

IS liaison

According to Del Henderson-Langdon, director of work systems consulting at DMR Group, Inc. in San Francisco, most of her firm's re-engineering projects have come about because of an IS manager acting as a liaison between consultants and senior management.

"IS becomes the enabler of re-engineering by adopting tools, methods and approaches," she says.

Of course, given the hefty risks associated with re-engineering, IS managers may be thankful they're not expected to play ringleader.

Big headaches often dog re-engineering programs, including employee resistance, turf battles when functional boundaries are crossed to redefine jobs and failure to attain the outrageous goals inherent in most re-engineering programs, says Michael Petitweiss, managing director at Petit & Co., a New York consulting firm.

According to Davenport, it's a high-risk, high-stakes game. Depending on the outcome, re-engineering leaders "either [will] become the company's next CEO or will be out on the street."

Jury still out

Despite the publicity, it's clear that re-engineering is still in its infancy, consultants acknowledge, and significant obstacles remain.

Management indifference remains very strong, Gulden says. In a recent CSC Index survey of 394 top IS executives, 40% said senior management does not see the importance of business re-engineering.

"It's difficult in the absence of a crisis for an organization to mobilize itself," Gulden says. "The fact is that if the wolf isn't at the door for many companies, they can't get unstuck."

Still, he says he is optimistic that new technology, including expert systems, data modeling schemes and workstation-based technology, will help drive acceptance of the idea.

For re-engineering to succeed, according to Davenport, it must be better linked with corporate quality programs.

"If you don't combine quality and redesign, the radical change champion in a company is at odds with the continued quality champion, and the organization gets confused," Davenport says.

> "WHETHER RE-ENGINEERING is practical in a company depends on who the players are and whether they're willing to take on bigger issues. It's very much a question of local climate."
>
> JON TURNER
> NEW YORK UNIVERSITY

Even if these advances are made, the idea may not be for everyone. "Whether re-engineering is practical in a company depends on who the players are and whether they're willing to take on bigger issues," NYU's Turner says. "It's very much a question of local climate."

Turner predicts that growing interest will attract more consulting firms seeking new business opportunities. "More consultants will sell re-engineering services — the same services they sold before, only painted white," Turner explains.

Most executives agree that the jury is still out on the question of whether re-engineering is worthwhile: "There are currently a whole lot of companies in the middle of the re-engineering process," Davenport says, "but they have no real results to show. The next few years will show if re-engineering is what we hope it will be." •

Re-engineering buzzes along

Top IS executives remain gung ho . . .

Top 5 issues of senior IS executives

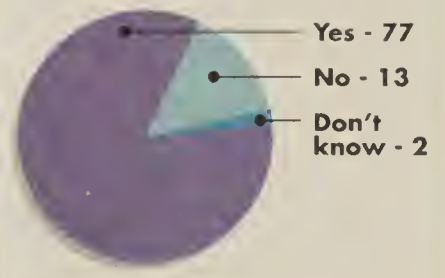
	'91	'90	'89	'88
Reshaping business processes through information technology	1	1	11	NR
Aligning IS and corporate goals	2	4	2	1
Instituting cross-functional systems	3	3	7	NR
Boosting software development productivity	4	6	13	12
Utilizing data	5	7	6	7

Base: 394 senior IS executives in North America

Source: CSC Index, Inc. annual survey of IS management issues

. . . so are *Computerworld Premier 100* winners

During the past year, has your organization redesigned or re-engineered any processes specifically to take advantage of information technology?

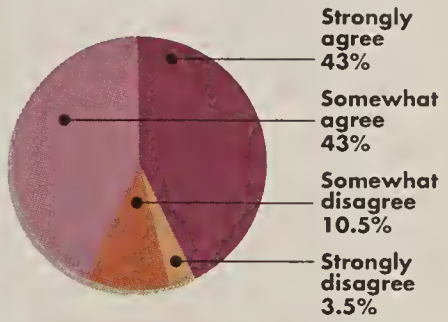


Number of respondents: 92

Source: Survey of 1990 *Computerworld Premier 100* winners

. . . and many top business managers

Information technology is reshaping many of our business processes, such as manufacturing, distribution or customer service, to name a few

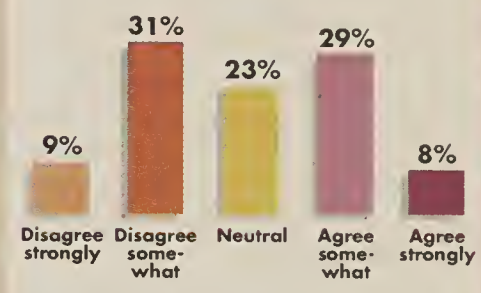


Percent of respondents
Bose: 200 CEOs, COOs, CFOs

Source: *Computerworld* - Andersen Consulting survey

. . . but not everyone is sold yet

In our organization, most senior business managers understand that transforming business processes through information technology is a key to achieving their competitive mandates



Percent of respondents
Bose: 394 senior IS executives in North America

Source: CSC Index, Inc. annual survey of IS management issues

CW Chart: Doreen St. John

Is re-engineering right for you?

Companies that decide to move into re-engineering need to plan carefully, be forward-thinking and establish that their need to re-engineer is real.

Because re-engineering can be so gut-wrenching for companies, Walter Popper, vice president of consulting firm CSC Index, Inc. in Cambridge, Mass., says, "You'd better know why you're doing it."

According to Popper, there are three keys — why, where and how — to knowing whether re-engineering is right for your firm:

▶**Why:** If a company cannot easily make a business case for establishing a re-engineering program, Popper says, "they don't have the necessary rationale."

The business case can be based on performance level or on product outcome but usually revolves around cost, quality, service and cycle time.

▶**Where:** Companies need to know where they will start the re-engineering process and how it will impact other areas. That focus should include an analytical look at the business — for instance, if a company improves the time it takes to complete Process A by 10%, will it improve the outcome of Process B by 50%?

▶**How:** Create a simplified, logical look at the processes of the business. That helps companies focus on the most critical aspects of their business, Popper says. For instance, an insurance company that creates a 30-page insurance policy might try to simplify that policy into one page. Deciding what goes on that one page will establish what the most critical and important components of that policy are.

ALAN J. RYAN

Who should re-engineer?

Despite its current popularity, re-engineering is better suited to certain types of companies, experts say

- Nonmanufacturing and high-technology firms facing tough foreign competition. Examples: Xerox Corp., IBM, Ford Motor Co.
- Companies in recently deregulated industries, especially insurance and banking. Examples: The Progressive Corp. Cigna RE
- Firms recently involved in mergers and acquisitions. Example: Baxter Healthcare Corp.
- Companies in need of a radical product breakthrough.
- Companies in highly competitive service industries. Example: Kentucky Fried Chicken Corp.
- Companies that don't have a deeply entrenched corporate culture.
- Companies under fire from heavy end-user demands.
- Companies facing financial crisis; i.e., several consecutive bad quarters.

CW Chart: Janell Genovese

Re-engineering puts Progressive on the spot

BY JULIA KING

Midnight, downtown Atlanta. A late-model sports car skids out of control on rain-slicked Peachtree St. The teenage driver careens into a utility pole, making a perfect letter V of the hood of his car. Miraculously, he walks away from the accident unhurt.

Moments after the police arrive, a van driven by an adjuster from the driver's insurance company appears. Less than one hour later, the car has been towed to a garage, and the driver has been driven home with a check in his pocket to cover the costs of repairing his smashed but salvageable car, hiring a rental car and even replacing his $75 stone-washed designer jeans, which were torn at the knees during the accident.

While the accident described here is imaginary, the insurance company van is real. It is one of the most visible symbols of the largest IS project ever tackled by The Progressive Corp.: a five-year, $28 million effort to automate claims processing.

Officials at the $15 million Mayfield, Ohio-based specialty insurer credit the 2-year-old system, dubbed Pacman (Progressive's Automated Claim Management), with averting a crisis and providing a springboard for national expansion into a new, much larger automobile insurance market.

"In terms of profitability and growth, [Progressive] is one of the best," says Gerald Lewinsohn, first vice president and insurance industry analyst at Merrill Lynch & Co.

Although Progressive calls the process "strategic redesign," Pacman is a textbook case of using re-engineering to take advantage of information technology.

At a glance

Company: The Progressive Corp., Mayfield, Ohio.
Goal: Increase profits, cut costs, avert financial crisis.
Solution: Five-year, $28 million re-engineering project to revamp claims processing operations, adopt policy of responding immediately to all accidents.
Benefit: Reduced claims paperwork, lower claims costs, entry into newer, lucrative national markets.

Facing a crisis

In 1986, company executives realized they had to make radical changes in how customers were serviced if Progressive was to survive cutthroat competition in the automobile insurance industry.

"Face it," says Bruce W. Marlow, Progressive's chief operating officer. "People just hate our product. The way insurance works, it isn't a good value. Other than the consumer, there's no one who really wants fewer accidents. Car mechanics and repair people, lawyers and hospitals all love accidents. The incentives of the system are to encourage more accidents and more grotesque injuries."

Jack Van Antwerp

Progressive's Marlow: *Re-engineering claims processing helped turn his company's 'crisis' into a boom*

So how do you increase profits and cut costs when you are selling a product nobody wants to buy in the first place? Beyond that, how do you do it in the face of mounting competition, unfavorable government regulation and skyrocketing increases in the price of doing business?

Progressive, which specializes in selling automobile coverage to drivers rejected or canceled by other insurers, saw that the answer to these questions lay in revamping its claims processing operations as well as adopting a companywide policy of responding immediately to all accidents, from a neighborhood fender bender to an interstate pileup.

It was clear, Marlow says, that only a complete rethinking of how the company did business could rescue it from "a crisis situation."

The process began in the claims department, which was largely paper-based and was run on a state-by-state basis. Some 175 claims offices across the country shuttled paperwork back and forth to company headquarters.

The goal was not only to reduce the flow of paper but also to shrink the number of days and even weeks between the time a claim was filed and the time it was paid.

Re-engineering was headed by Pat Cadden, former senior vice president of corporate claims; Rex Woolf, senior vice president of IS, and Barbara Cope, IS director.

Pacman was built around an IBM 3090 mainframe and Compaq Computer Corp. personal computers. More than 200 people spent 100,000 staff hours developing software and other projects during a two-year period.

Three years later, in July 1989, Pacman was rolled out. Up and running for two years, the system has automated and reduced routine paperwork and cut claims costs.

Today, for example, all policy underwriting is done using workstation-based expert systems, which can more accurately work up exact cost estimates and more easily detect fraud, according to Marlow.

This past January, phase two of the redesign — the immediate response program — began in selected test areas of Virginia. Under the program, adjusters, on call 24 hours per day, are dispatched immediately to the scene of an accident. Often, they leave only after issuing a check on the spot, closing out the claim.

Chuck Young

On the spot: *A Progressive representative goes to the scene of an auto accident and settles a claim immediately*

Under a regional pilot project in Atlanta, adjusters work out of 12 roving vans equipped with a Compaq PC and modem to link via telephone into the Pacman system, a fax machine and cellular telephones. In addition to taking claims information and issuing payment, adjusters also make tow truck, hotel or other arrangements for stranded policyholders.

Marlow says both Pacman and the immediate response program have dramatically changed the way Progressive claims adjusters do their jobs. Once confined to their desks for most of the day, adjusters now spend most of their working hours with current policyholders and prospective customers. Surprisingly, Marlow says, adjusters embraced their new jobs and more flexible hours.

What the company didn't foresee was what Marlow calls the "staggering ripple effects" the program had on the rest of the company's 6,100 employees. Agents, reluctant to relinquish control over their own client base, at first were slow to turn over calls directly to claims adjusters. A second problem was how to instill a fast-response mentality into employees from other departments.

To help educate employees, the company spent an extra $1.3 million on training, including orientation and reference videos, computer-based training, a 40-hour live training class, two user manuals and a variety of support documentation.

Business drives process

Marlow's main advice to other companies is that senior management should bank on re-engineering taking longer than they would like. At Progressive, upper management began planning for changes in 1986. Actual implementation of the automated claims processing system and immediate response programs came three and five years after initial planning.

"When you're talking about fundamental changes in jobs, you have to give people time to get used to the idea," he says.

Marlow offers no hard figures on just how much the company has saved as a result of its strategic redesign. Job changes also extended to the re-engineering champions. After the project, Cadden was promoted to president of the southeast division, and Cope took up cattle farming in Missouri. In May 1990, Woolf left the firm to become a consultant and was succeeded in March 1991 by MCI Communications Corp.'s Alan Ditchfield.

But he notes that the immediate response program and automated claims processing system have helped launch Progressive from its $15 million niche business of selling nonstandard insurance to the $75 million market for standard automobile coverage.

"By taking a hard look in the mirror, we've launched ourselves into a marketplace that is six times the size of our current market," Marlow says. •

Other passengers on the re-engineering track

Mutual Benefit Life Insurance Co. The U.S.' 18th largest life insurer undertook a three-year effort to re-engineer how it issued new policies. By scrapping a 146-year-old process, the Newark, N.J., company reduced turnaround time, reducing errors and boosting sales by 20%.

Ontario Ministry of Revenue. The tax collection agency of this Canadian province embarked on a five-year, $38 million project to boost tax collections and increase work load without adding to its 4,300 employees.

American Express Co. The multinational giant wanted to improve the cost, time and quality of its credit authorization process. Redesigning around an expert system cut the number of improper credit denials by 30%, slashed average time for credit authorization by 25% and trimmed costs from credit losses by $7 million per year.

Kentucky Fried Chicken Corp. The Louisville, Ky., subsidiary of Pepsico, Inc. has embarked on a $25 million re-engineering project. The goal is to create what management calls "the computer-integrated restaurant" in its 8,000 locations using PCs, point-of-sale terminals and links to host databases.

Union Camp Corp. The standards-based re-engineering efforts of this Wayne, N.J., manufacturer are aimed at providing mill operators with more information about materials and production schedules, costs and market prices.

No more defects!

Motorola's chairman had an idea: Institute a companywide defect reduction effort called Six Sigma. His IS staff took this mandate to heart

BY GLENN RIFKIN

In 1987, Robert Galvin, chairman of Motorola, Inc., sent out a directive to all employees to set in motion a five-year quality improvement program. He gave this project a name that clearly spelled out its goal to anyone familiar with the pioneering statistical quality control work of W. Edwards Deming and Joseph Juran — Six Sigma.

This is a term used by statisticians and engineers to describe a state of zero defects, or as close as the experts estimate it is possible to come — 3.4 defective parts per 1 million. (For details on Six Sigma, see box below.)

Galvin says he felt it was a concept the whole company could embrace. And he didn't just have a goal, he had a timetable: Improve product and services quality 10 times by 1989, improve them at least 100 times by 1991, and hit the final goal — Six Sigma — by 1992.

Although the process of defect reduction had traditionally been applied to manufacturing operations, Schaumburg, Ill.-based Motorola took the daring step of implementing Six Sigma across the entire corporation, including information systems, which has experienced productivity improvements of 40%. Motorola was the first major corporation to embrace Six Sigma as its technique for defect reduction and the most visible to hoist the Six Sigma banner for its entire quality improvement program.

Russell O. Jones

Rifkin is a free-lance writer and a former *Computerworld* features editor.

Motive behind the move

Galvin, in a January 1987 memo to all employees, explained the reasons for Six Sigma. In 1986, he had traveled extensively visiting customers and had repeatedly heard the same refrain: "[Customers] said they liked doing business with Motorola, but they also said, 'Why don't you serve us better in delivery, in order completeness, in accuracy of records of each transaction, etc.? If you would just serve us in the fashion that we need to be served from a total quality standpoint, you could have from 5% to 20% more of our business.' "

With the mid-1980s being a difficult time for giant semiconductor makers, Motorola couldn't pass up such a challenge — new business was there for the taking if the company could just improve its processes. Galvin turned to people inside the company, such as Richard Buetow, senior vice president and director of corporate quality, for advice.

Buetow had been carefully monitoring quality and defect issues in the Far East for years. He had benchmarked error rates, for example, from Japanese companies using the same equipment Motorola used and had found they were controlling their error rates to Six Sigma. Motorola's average was closer to Four Sigma, or 99.4% quality. Not bad — until the company realized that meant about 6,000 defects per million opportunities.

The revelation was instant and clear: Motorola needed to achieve better defect rates by instituting new processes to control those defects. "The highest quality produced the lowest cost manufacturing," Buetow says. "If you don't produce defects, you don't have to spend money repairing defects, and you don't need extra people and equipment."

Most striking to Galvin was that products could be produced without any defects at all. The common wisdom in the manufacturing industry had always been that you simply produced some products with defects and then repaired them.

Buetow estimates that Motorola has saved $1.5 billion in reduced costs because of Six Sigma since the plan's inception. By reducing cycle time and cutting out defects, for example, Motorola has been able to cut the cost of its final audit by more than $44 million.

Motorola won the Malcolm Baldrige National Quality Award in 1988 and has become a standard-bearer for quality in U.S. industry. Employees find themselves in demand to give speeches and presentations on Six Sigma.

Les Shroyer, Motorola's chief information officer, speaks to dozens of companies each year about how Six Sigma has affected the company's IS operations. He lets them

Continued on page 61

Deviant behavior

SIX SIGMA

Sigma, the 18th letter of the Greek alphabet, refers to the number of standard deviations from the mean in any given statistically measurable process. If, for example, you were measuring the heights of 1,000 people in a room and plotting the information on a bell-shaped curve, most of the people (68.26%) would fit within plus or minus One Sigma of the median height of, say, 5 ft 9 in.

As you move away from the average to include people below and above that height, you would encompass a greater percentage of people. For example, Two Sigma represents 95.46%, and Three Sigma jumps to 99.73%.

In terms of defect reduction, most current processes fall into the Three Sigma range, which most businesspeople have accepted as good enough. But Three Sigma means that 66,810 parts per million are defective. A move to Six Sigma, however, is as close to perfection (99.9999998%) as statistically possible. Reaching Six Sigma translates into just 3.4 defective parts per million.

Computerworld
EDITORIAL REPRINTS

Reprints from *Computerworld* provide a valuable marketing/sales tool for your company!

Editorial articles are available as reprints and can be ordered in various quantities, and customized to include your company logo and sales offices. Whether you wish to have reprints of an article written specifically about your company or a subject of general interest, these reprints* can be a great resource for use in:

■ Promotional/P.R. materials ■ Internal meetings ■ Company seminars

* Produced in minimum quantities of 500 for black-and-white and two color reprints; 1,000 for four- color reprints.

For complete information on ordering reprints contact:

Sharon Bryant
Reprints Department
Computerworld
375 Cochituate Road
Framingham, MA 01701-9171
Tel. 508-879-0700

COMPUTERWORLD

INSIDE

IBM kick-starts SAA onto office track

Migration worry mutes user praise

Runaway program gores Sabre

COMPUTERWORLD

The newspaper for information systems management

More Systems and Software!

51 Issues for ~~$48~~ NOW ONLY $38.95

Yes, I want more. I accept your offer of $38.95 for 51 weekly issues. That's a savings of over $9.00 off the basic subscription rate.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $58.97, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information below to qualify for this special rate.

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgmt; Dir./Mgr PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4128-1

Recyclable Paper

More PCs and Workstations!

51 Issues for ~~$48~~ NOW ONLY $38.95

Yes, I want more. I accept your offer of $38.95 for 51 weekly issues. That's a savings of over $9.00 off the basic subscription rate.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $58.97, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information below to qualify for this special rate.

1. **BUSINESS/INDUSTRY** (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgmt; Dir./Mgr PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
60. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

E4128-1

Recyclable Paper

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

Continued from page 59

know that because of quality improvements, Motorola's IS group has already achieved up to 40% productivity improvements in hardware and network-type functions.

According to Shroyer, Motorola's IS group has instituted a six-step Six Sigma process across the organization:

▶1. Identify your product. What is the service or product you are producing? IS professionals must align what they see with what the customers want, he says.

Typically, the way IS views an issue, such as the number of lines of code needed to create a new application, is meaningless to an end user who is worried about how to push through more journal vouchers or invoices.

▶2. Identify customer requirements. IS must know what the customer perceives as a defect-free product or service. A payroll system, for example, is a straightforward target for Six Sigma. Paychecks are produced either on time or late; calculations are either correct or wrong. So the metric within IS at Motorola is based on the number of perfect paychecks per million produced as opposed to measuring defects per thousand lines of code.

Shroyer: *Six Sigma improved productivity*

The same can be said for a manufacturing system measuring the number of defects per lot move or a financial system in which the person handling general ledger worries about defects per journal voucher. "You have to understand the unit of work the user is dealing with," Shroyer says.

▶3. Diagnose the frequency and source of errors. Very rarely were paychecks calculated incorrectly, but it was not uncommon for checks to be late or re-run unnecessarily. Motorola's IS staff had to trace the errors back to their source — keypunch or some other media-type discrepancy — and then systematically eliminate them. Payroll at Motorola will achieve Six Sigma this year, Shroyer says.

Although payroll is fairly straightforward, Shroyer says, Six Sigma can be applied to any application. Within Motorola's IS group, there are metrics established in four categories to target defect reduction: new software development, service delivery, cycle time and customer satisfaction. The last, Shroyer says, is a detailed survey designed to validate the first three metrics. The bottom line is: If it doesn't feel right to the customer, it isn't defect-free.

▶4. Define a process for doing the task. Motorola calls this process "mapping." It is not unlike old-time flowcharts, Shroyer says, or what is being called "re-engineering" today. At Motorola, the process involves using personal computer-based tools to determine flow-through of processes: Which processes can be eliminated and which can be simplified?

▶5. Mistake-proof the process. The idea is to streamline any given process and eliminate unnecessary steps or cycle time to make it mistake-proof. The concept is to use metrics to provide statistical process control so that a problem can be addressed before it affects output. In manufacturing, for example, a cross-functional team of IS, engineering, manufacturing and design might find a way to take a 47-step process down to 21 steps, thus eliminating opportunities for errors.

▶6. Put permanent control measures in place. It is not enough to reach Six Sigma. The goal is to remain at that level. This step was designed to set up the Six Sigma metrics used to evaluate the entire process that will ensure it is continuously defect-free. Shroyer says Motorola revisits this step frequently.

"I run a monthly quality review," Shroyer says. "Everybody gets up and talks about their metric — what is the trend, what is the diagnosis of source cause of errors, what are they doing about it, what is the action plan. We spend more time on the process and less time reviewing the output of the process."

The emphasis at Motorola is on metrics. "We're of the mentality that if you can't measure it, you can't control it," Shroyer says. In order to measure the Sigma level, every process must be broken down into its critical pieces and then benchmarked. How is a check processed? How is a room cleaned? How is a part soldered? Six Sigma is providing the capability to measure virtually every process within IS and give it a rating and a target for improvement or elimination.

Shroyer points out, for example, that in the area of semiconductors, a chip that costs just a few dollars may travel 30,000 miles before landing at the customer's dock. Because chip manufacturing at Motorola is a process that has high IS content (mostly through computer-integrated manufacturing), it is incumbent on the IS group to monitor each step carefully in the making and delivery of the product.

"The whole secret to this is to do something the same way every time — to center the mean and reduce the variation," Buetow explains. "You can build a very good product this way."

Shroyer boasts that Motorola has been able to measure processes that others consider immeasurable, both within IS and in the data center.

The 2,500-person IS group, which is set up as a matrix organization across various business units (except for independent IS groups in each of six large business units), is applying the six-step process to all hardware and network operations already in place at Motorola and is halfway through applying it to software development applications. Designing software, Shroyer points out, is a much slower process because it must be nudged from an art form to a measurable process before it can be rigorously controlled.

Reliability of databases, packet switches and even air-conditioning are also targets of Six Sigma efforts.

Shroyer cautions that a company must be serious about the Six Sigma concept. "If people think this is just another 'program of the month,' it won't work. My advice is: Don't start it unless you intend to follow through."

For IS, being well-versed in defect reduction has benefits beyond quality and customer satisfaction: It can give a company the upper hand with its vendors and suppliers.

Motorola, Inc.'s Six Sigma benefits at a glance

IS benefits

- Increased IS productivity in hardware and network functions by 40%.
- Reduced IBM Systems Network Architecture defects from 6,210 defects per million parts to 10 to 15 defects per million parts.
- Reduced backlog from years to months as IS focused on exactly what users need.
- Increased customer service levels.
- Shifted IS time from correcting mistakes to value-added work.
- Motivated IS work force that doesn't have to deal with irritating, recurring problems.
- Gave IS upper hand with suppliers because quality data is kept about supplier products.

Business benefits

- Saved $1.5 billion in reduced cost; cut cost of final audit by about $44 million due to shortened cycle times and fewer defects.
- Won 1988 Malcolm Baldrige National Quality Award.

CW Chart: Janell Genovese

Six Sigma nearly impossible without top-notch information flow

IBM redesigned process to ensure quality, reduce cycle times and gauge customer satisfaction better

Achieving Six Sigma may depend more heavily on IS than on any other function in a company. Ask IBM: "You can't become a Six Sigma company if the information flows across the business aren't at Six Sigma levels," states Larry Ford, IBM's vice president of IS and telecommunications.

Ford has spent the last 18 months overseeing the implementation of IBM's five-pronged market-driven quality program within the corporation's worldwide IS organization. Included in the program is Six Sigma, which IBM borrowed from a major customer, Motorola.

IBM borrowed Motorola's goals as well. IBM is shooting to achieve a tenfold improvement in defect reduction within two years and a 100-fold improvement in four years.

Rolling out a Six Sigma concept into IBM's IS group is no easy task. It requires training each of the 27,000 IS professionals in the various concepts of Six Sigma through company-sponsored courses within IS and instilling goals of reduced cycle times and new measurements for customer satisfaction.

Ford says achieving zero defects in IS is tied to reducing cycle times. Not only is it imperative to measure defects in new code and the throughput development process, but those measurements can also be effective only when coupled with cutting the time it takes to fulfill a customer's request for a new application. "If a user has a two-year wait to get an application from IS, he is certainly not going to be able to get a tenfold increase in quality in two years," Ford says.

Ford adds that Six Sigma is forcing IS to measure customer satisfaction in new ways. "Does the customer have the information he needs to do the job? Is it available when he needs it? This requires a fundamental change in the way you manage IS. It's no longer a utility — it has to be managed as part of the business strategy."

To facilitate this huge rollout, IBM decided it had to identify and integrate the Top 12 business processes in the company, including marketing, development, manufacturing and sales. "If you want to get a 100-times improvement in fulfillment, for example, you can't do it without interacting with all the other processes," Ford says.

Ford also notes that because IS serves users across all of IBM, the ability to achieve Six Sigma within IS depends on interdepartmental relationships. Various organizations within IBM are only now learning how to think in process terms — measurable methods that can lead to defect reduction. Even if IS provides a superior process, Ford says, problems can arise when it interacts with another department whose process skills are low.

The billing process, for example, is viewed from a variety of aspects, both from within IS and from the customer's point of view. "The code we developed may be without defects," Ford says, "but the process itself may be broken." Therefore, IBM has had to re-examine and redesign all of its processes.

A recent internal memo from IBM Chairman John Akers hit that point directly. Akers claimed to be tired of hearing about quality and cycle time reductions internally while still receiving complaints from customers.

While implementing Six Sigma techniques, IS sites are also adopting the criteria for the Malcolm Baldrige National Quality Award, not only to achieve world-class Baldrige scores but also to vie for internal IBM quality awards.

Six Sigma is moving quickly throughout IS at IBM. Virtually all of IBM's U.S. sites have been trained, and Ford says European sites will be on board in approximately 90 days.

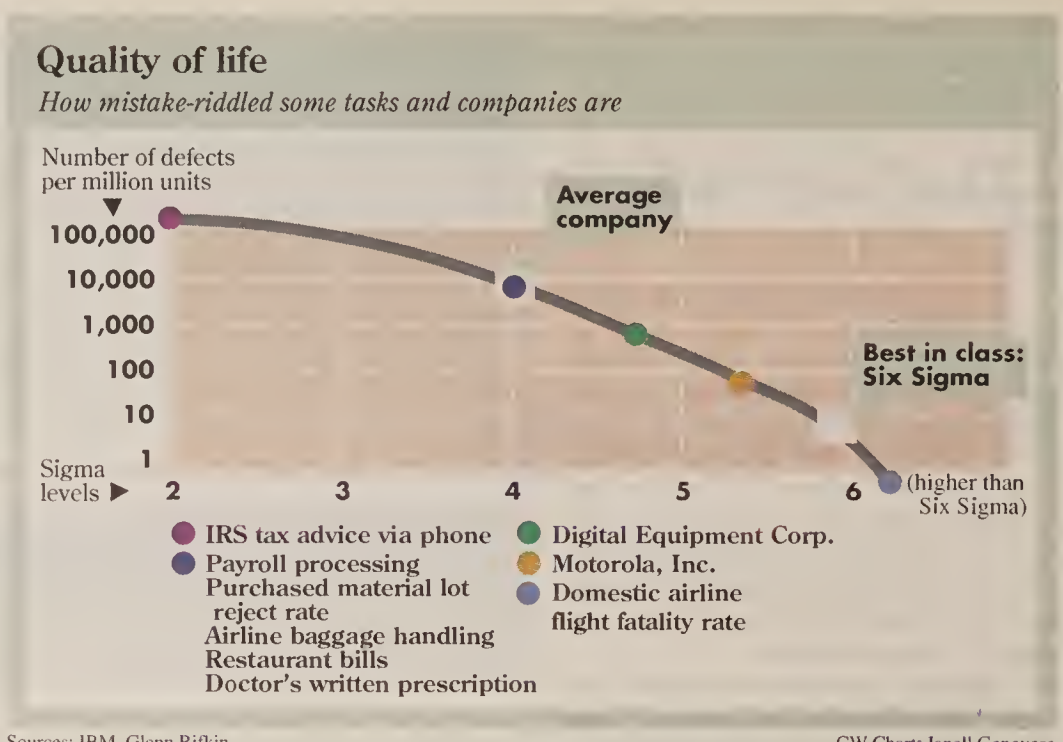
GLENN RIFKIN

"We can show them what they look like vs. the rest of the industry," Shroyer says. "I've had doors open at the highest levels of our vendor companies — senior people that IS doesn't usually see — because we know more about their quality levels than they do."

Motorola has formed strong partnerships with its communications vendors, including AT&T, U.S. Sprint Communications Co. and MCI Communications Corp., and has been able to approach all of them with hard data about the quality of their products.

Six Sigma also becomes more attainable if a company's key vendors understand and practice the concept themselves. In Motorola's case, both IBM and Digital Equipment Corp. have embraced Six Sigma internally (see stories page 61 and below). By understanding Six Sigma, the companies share a common language and set mutually beneficial goals.

Shroyer says Motorola's IBM mainframes are running at about a 5.2 Sigma level, which translates into just a few minutes of downtime per year. But neither company is satisfied with that, and together they are hoping to break the Six Sigma barrier.



Sources: IBM, Glenn Rifkin

CW Chart: Janell Genovese

Stephen Schwartz, IBM's senior vice president of market-driven quality, is pushing hard at getting Six Sigma in place across IBM. Schwartz says that although 99% defect-free "sounds terrific," it translates into 20,000 pieces of mail lost every hour; 5,000 incorrect surgical procedures every week and 10 defects out of every 1,000 solder joints on a computer motherboard from IBM.

Six Sigma represents 99.9999998% uptime for the mainframe and Motorola's vast IBM Systems Network Architecture (SNA) network. When the IS group first measured the SNA network and its 60,000 defined devices, they discovered it was running at a Four Sigma level, which translates into 6,210 defects per million opportunities, or 99.4% quality.

IS worked with its vendors and determined the source of most of the problems. They dynamically changed many of the device updates — the source of the problems — and after several months of work, the network is closing in on Six Sigma.

Instead of 6,000-plus defects per million parts, there are now only 10 or 15 per million. "It not only gives a much higher service level to your customers, because someone was on the other end of those defects, but it also frees up a couple of people in IS who don't have to chase those problems anymore," Shroyer says. "They can do value-added work now."

The by-product of such close scrutiny is an extremely motivated work force because the problems were irritants not just to the end users but to the IS staff as well. "They're the ones who got woken up in the middle of the night when the network went down," Shroyer says.

This freeing up of personnel may be the only way to handle the increasing demand for new applications without spending more money on new IS people.

Six Sigma is also having a dramatic impact on applications backlog. According to Shroyer, Six Sigma speeds up the interminable backlog request list by focusing the user population on what it really needs and what is simply unnecessary. The users, faced with the task of implementing Six Sigma, must refocus attention on the work they are doing. Which processes are critical? Which ones can be eliminated? By so doing, they find they are cutting out unnecessary IS requests.

By calibrating which items on the to-do list are critical and putting its efforts into creating software factories, IS is developing applications in months rather than years. Motorola developed metrics for the average age of a backlogged item and for defect levels on prerelease, release and postrelease applications.

Exaggerated credibility

Shroyer acknowledges that Six Sigma sometimes gives Motorola more credibility than it may deserve, but he doesn't hesitate to use the enhanced purchasing power with vendors or share Six Sigma information with anyone who wants it.

The first thing he tells inquiring parties is that Six Sigma applies to the whole corporation, not just a few key departments. At Motorola, managers from accounting to sales to IS were directed to learn Six Sigma techniques and remove unnecessary defects and resulting costs from their operations.

What it all boils down to, Shroyer says, is that Six Sigma is simply a basic quality program, and quality is now a matter of survival. "If you are not practicing hard at that, you're going out of business. It's only a matter of time and sooner rather than later." •

DOS, OS, or CICS Frustration?

BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIM-VIO — DOS/VSE Virtual Disk Drive. Moves the Standard Label Area directly into memory and allows for other heavily used non-permanent files to be moved into memory as well.

BIM-VSUM — Provides powerful design, monitoring and tuning capabilities for MVS VSAM catalogs and data sets. BIM-VSUM can be executed in either TSO/ISPF mode or batch. NEW

BIMWNDOW — Multiple terminal sessions concurrently at CRT under **DOS** or **OS** VTAM.

BIM-EDIT/DOS — The most powerful, flexible full screen editor available for DOS/VSE.

BIM-EDIT/MVS — All of the features of our popular DOS editor and does not require the overhead of TSO. Can be accessed directly from VTAM or from CICS or other terminal subsystems.

BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982).

BIMSPLSR — Optional laser printer support for BIMSPOOL.

BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.

BIMSPLIT — May be used separately or with BIMSPOOL to print parts of an existing job to terminal printers at separate sites.

BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.

BIM-PADS — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.

BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. **ODISTRAK** is an optional historical reporting feature to be used with BIM-ODIS to generate reports relating to system usage. **DOS** and **OS**.

BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers.

BIM-PACK — Automatically compresses selected VSAM files transparent to applications and end users under DOS.

BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. **DOS** and **OS**.

BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.

BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. **DOS** and **OS**.

BIM-FMAP — CICS BMS on-line map generation and maintenance. **DOS** and **OS**.

BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration. **DOS** and **OS**.

BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. **DOS** and **OS**.

BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.

BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.

BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.

BIMSUBMT — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, some less than $800, average $2500. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4361-5 system, on-site or remote.

BIM® B I MOYLE ASSOCIATES, INC.
5788 Lincoln Drive
Minneapolis, MN 55436
612-933-2885
Fax (612) 933-7764
Member Independent Computer Consultants Assn.

DEC sets sights on Six Sigma

Not to be outdone by IBM, another of Motorola's customers, DEC is bringing Six Sigma to its IS function as well as to the rest of the company. DEC is just getting started this year with Six Sigma in IS.

According to Kaye MacKenzie, a quality program manager within DEC's IS group, Six Sigma provides a common language among IS and users to help achieve zero-defect levels jointly. MacKenzie says DEC is concentrating on three key questions in its Six Sigma implementation: How do we do things right with high quality, delivered on time and at the right price? How do we do the right thing? And how do we ensure DEC will be competitive in three to five years?

Ken Potashner, DEC's Six Sigma coordinator, says it is difficult to generalize about the value of Six Sigma across the entire IS organization in such a large company, but he says the storage group and Unix workstation group have each reported cost savings of 25% because of defect reductions.

Potashner adds that Six Sigma is difficult to weave into a software environment, which is more art than science, so "we decided to start with activities that do fall into the process realm."

Even though DEC's Six Sigma program is still young, MacKenzie says she is pleased with the initial response. "A year ago, there would have been eyes rolling," she says. "Now, they say, 'Yeah, we've got to do this.' "

GLENN RIFKIN

NATIONAL BRIEFS

Up and outsourcing

▶ **Computer Sciences Corp.** last week acquired Raleigh, N.C.-based **Compusource**, a $20 million, privately held time-sharing and disaster recovery services firm. While the El Segundo, Calif.-based outsourcing player declined to disclose the terms of the deal, it made no secret of the strategy behind it. "Compusource greatly enhances our ability to expand our outsourcing services in the commercial insurance market and also to gain valuable access to additional opportunities in the financial services marketplace," said CSC Industry Services Group President Van B. Honeycutt.

North by northwest

▶ U.S.-based computer firms or would-be computer firms in need of funding have two new directions in which to turn: north to Canada or northwest to San Francisco. The **Canadian Imperial Bank of Commerce** early this month announced a new corporate group created specifically to serve the needs of the U.S. electronics industry and designated San Francisco as the site for the new unit's headquarters.

Goal scores again

▶ **Goal Systems International, Inc.**, which roared down the acquisition trail some 18 months ago, is at it again. The Columbus, Ohio-based systems software and services provider paid $1 million for **Teaching By Computer, Inc.**, a Boston-area firm whose recently developed, yet-to-be-marketed multiplatform computer-based training system will now debut as a Goal offering. The acquiree's development team as well as its president, Michael Koffman, will become part of Goal's Information Technology Division.

Paperback rider

▶ Orinda, Calif.-based **Wordtech Systems, Inc.**, maker of Dbase-compatible database management systems, will soon be making the systems with the aid of two product lines acquired this month from **Paperback Software International, Inc.** VP-Expert lets users develop expert systems without resorting to artificial intelligence languages; VP Graphics is an object-based presentation graphics tool.

Fast performance, slow sell

Parallel machines snapped up in science market, but business users balk

BY MICHAEL ALEXANDER
CW STAFF

Massively parallel processing computers are proving their mettle on the science side of the market every day, playing an important role in solving so-called grand-challenge science problems. Superfast, high-performance machines are being used for such tasks as running simulations of global warming and searching through massive volumes of radio-telescope data for the faint and complex signatures of binary pulsars.

However, when it comes to figuring out how to crack the business market, parallel machines are drawing a blank. Only a handful of companies are running commercial applications on these high-performance machines. For the most part, these exceptions are companies involved with highly technical and scientific businesses, such as aerospace, automotive, pharmaceutical and petroleum companies.

But who knows where or when?

The massively parallel processing computer market is due for a boom, analysts predict — but massive obstacles stand in its way

1990 sales:	less than $200M
1994 sales:	projected at $590M

On one hand:

- The average IS director is resisting the lure of massively parallel technology.
- Not much software exists for the mighty platforms.
- Parallel processors are hard to program.

On the other hand:

- Wider availability of compilers and the rise of standards could help boost parallel processors over the programming roadblock.
- New applications — context-sensitive text retrieval for instance — could trigger the boom.

CW Chart: Eric Cormier

Sales on the rise

Sales of massively parallel supercomputers, which have been mainly to research labs, were less than $200 million last year, according to Gary Smaby, a supercomputer analyst in Minneapolis. Smaby projected the market will take off and grow by about 38% per year to hit $590 million by 1994.

In comparison, sales of traditional supercomputers reached $1.1 billion last year but are growing at only about 9% per year.

Intel Corp., Ncube, Maspar Computer Corp., Supercomputer Systems, Inc., Thinking Machines, Corp., Teradata Corp. and Digital Equipment Corp. market massively parallel processing machines. IBM, Cray Research, Inc. and Convex Computer Corp. are also working on parallel processing machines.

Intel, perhaps more than any other parallel computer vendor, has had some success selling its parallel processing machines to commercial accounts.

In mid-1989 Prudential Securities, Inc. became the first Wall Street firm to acquire a parallel supercomputer — a 32-node IPSC/2 from Intel — to aid in its stock market activities.

Intel's machines, developed at the firm's Supercomputer Systems Division in Beaverton, Ore., accounted for about 37%, or 83, of the 224 parallel processors shipped in 1989, according to market research firm International Data Corp. in Framingham, Mass.

Intel also claims the current speed record for supercomputers of any kind. Its Touchstone Delta parallel machine, which is installed at the California Institute of Technology, is capable of doing 12 billion calculations per second, according to Elliott Swan, manager of product and technical marketing at Intel. "It's the most powerful machine today," Swan declared.

"Parallel processing is the bandwagon of the future," said David Lowry, a Westford, Mass.-based consultant and self-styled champion of high-performance systems. The recent arrival of IBM, DEC and supercomputer designer Seymour Cray in the parallel processor business "has finally legitimized the technology," Lowry said.

However, there remain several formidable obstacles that the parallel machines will have to hurdle before they crack open the corporate market in a big way.

"The average IS person is not going to buy into the technology," Lowry said. IS managers are unwilling to adapt "after earning their stripes on making IBM mainframes sing." At the same time, however, IS chiefs are pinned under a nationwide applications backlog that averages 2½ years, Lowry said.

A dearth of software

The primary obstacle is a lack of software developed especially to run on parallel machines. The problem stems from the initial cost of developing software as well as the cost of maintaining it and porting it to new systems. In addition, most of the software that is developed remains proprietary even while the computer industry is shifting to open systems.

Moreover, parallel processing machines are difficult to program. At issue is the design of the machines, which come in two types. Multiple instruction, multiple data (MIMD) machines break a program into several parts that run concurrently on separate processors. In comparison, single instruction, multiple data (SIMD) machines spread data among parallel processors and then simultaneously process them, a single instruction at a

Continued on page 64

How — and how much?

Unlike conventional supercomputers, which work on problems sequentially, massively parallel processing computers harness the computing power of hundreds or more microprocessors to tackle different parts of a problem at once.

The machines are relatively inexpensive — a bargain when compared with mainframes and conventional supercomputers — and capable of leaving many more physically imposing machines in the dust.

Maspar's basic MP-1 parallel computer, for example, is priced at $170,000, which puts it in the middle of the price range for traditional minicomputers. The machine uses 1,024 processors and performs at 26,000 million instructions per second.

MICHAEL ALEXANDER

Systems integrator to jump-start DEC

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Digital Equipment Corp.'s European unit has decided to collaborate with what it calls a "lean and mean" systems integrator in the U.S. in order to get a new software product line to market faster.

DEC Europe and Information Systems Experts, Inc. (ISE), a small integrator with 10 employees based in Washington, D.C., formed a partnership late last month to develop and market software that integrates sales, marketing and customer services functions.

The core module of the software along with several functional submodules will be released this fall, said Barton J. Goldenberg, chairman of ISE.

Ulf Akerberg, a DEC Europe marketing manager in Munich, described ISE as "a lean and mean systems integrator, which is helping us to get the product ready for initial market penetration within a few months." The turnaround time, Akerberg said, is "a tremendous achievement by any standard."

Goldenberg said ISE's involvement will cut the software development time by at least 50% because the firm uses such techniques as rapid prototyping and object-oriented programming. ISE has written the design specifications, based on five years of market research on sales and marketing automation.

Large computer companies such as IBM, DEC and Hewlett-Packard Co. are increasingly turning to smaller software firms for a jump start, Goldenberg said. "They realize that unless they become more nimble from a marketing perspective, they will continuously lose market niches to more aggressive, smaller companies," he said.

INTERNATIONAL
BRIEFS

Hit in the wallet

▶ **IBM Japan Ltd.** executives, including President Takeo Shiina, are seeing their annual pay cut by as much as 10% this year, according to a report in the Asian business press. The reduction reflects management's responsibility for the earnings decline recently reported by IBM's Japanese subsidiary, the report said. For the year ended December 1990, IBM Japan posted profits down 20% from those of the previous year.

Hung up

▶ The most controversial part of the **UK** government's telecommunications policy was abandoned earlier this month in what a report in the British financial press said amounts to a victory for UK-based **Mercury Communications** and other competitors of national telephone network **British Telecommunications PLC.** In a policy reversal, Oftel, the UK industry regulator, said it would seek authority to waive access charges that competitors were to have paid British Telecom for using its network.

Chinese imports

▶ **China** imported some $108 million worth of computers and related equipment in the first quarter of 1991, according to the Chinese business press — approximately 50% more than the country imported during the comparable period last year. The increase indicates that China is recovering from its limited spending on information systems, the report said.

Buy, buy, buy

▶ France's **Commissariat General du Plan**, an official planning body, recently called for a "Buy European" act to encourage public organizations to buy electronic equipment manufactured in Europe, according to a report in the British business press. The Commissariat also wants to reward electronics equipment manufacturers for Europe-based components sourcing. It suggested that the continent's three leading suppliers — The Netherlands' **N.V. Philips Telecommunications N.V.**, Germany's **Siemens AG** and France's **SGS-Thomson** — work together on such goals.

Steel deal

▶ Japanese steelmaker **NKK Corp.** and U.S.-based **Convex Computer Corp.** said they will cooperate in marketing Convex supercomputers worldwide. They will begin shipping the co-developed Preemptor 5000 series in April 1992, officials said. NKK, along with other Japanese steelmakers, has been diversifying into the electronics business in the past few years. Nippon Steel and Kawasaki Steel have been particularly aggressive in branching out.

DBA Tool Kit • Training Tool Kit • End User Tool Kit

SQL/DS WORKBENCH

"SQL/DS Workbench for VM does 90 to 95% of what a DBA needs to do on a daily basis."

John Wright,
CDB Software developer
and former DBA

95%

- Catalog Management and Analysis
- Utility Generation and Management
- DDL Generation and Manipulation
- Migration

Yes, I want the SQL/DS Survival Kit:

Name _____
Company _____
Address _____
_____
_____
_____
Telephone _____

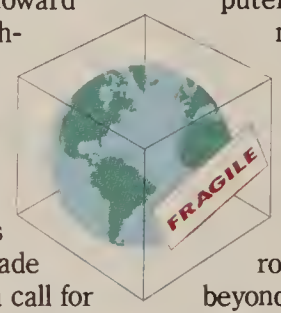
CDB Software, Inc.
6464 Savoy, Suite 120
Dept. C
Houston, Texas 77036
713-780-2382
FAX 713-784-1842

PC makers prove it's easy being green in CFC removal

BY MICHAEL FITZGERALD
CW STAFF

Major makers of personal computers are turning green, though not with envy.

The pursuit of environmentally safe manufacturing practices is giving a green tint to companies such as IBM, Compaq Computer Corp. and Apple Computer, Inc. All three have moved toward manufacturing computers without using chlorofluorocarbons (CFC), considered a major cause in the depletion of the Earth's ozone layer. They may be joined by their Japanese counterparts — Japan's Ministry of International Trade and Industry on July 1 issued a call for all Japanese manufacturers to stop using CFCs.



PC makers use CFCs to remove solder residues from circuit boards and to treat hard drives. In some instances, the foam contained in packing cases is made with CFCs. Most companies do not expect to cease using CFCs immediately. Compaq, Apple and IBM, however, all aim to be CFC-free by 1995.

Compaq points to the end of that cycle. "We can't do it all at once," said John Sweney, a Compaq spokesman. "We'll convert as it makes sense."

Compaq expects to save money as well as the environment by eliminating CFCs, Sweney said. Costly equipment and factory floor space will no longer be needed.

Apple announced on April 22 it had developed a "no-clean" process for circuit board manufacturing that required no CFCs. The company said it expected to be CFC-free by mid-1992.

IBM's stated aim as a corporation is to stop using CFCs by 1993. The company's hard drive manufacturing plant in Kurosawa, Japan has already returned to ionized water solutions for treating hard drives, and IBM no longer packs its PCs in foam made with CFCs. Its PC production plant in Greenock, Scotland, makes computers using no CFCs at all during the manufacturing process. IBM spokesman Mac Jeffery said the company has reduced CFC emissions worldwide by 63% since 1987 and by 77% at its U.S. facilities.

The push to practice environmentally safe techniques goes beyond CFCs [CW, July 1], although vendors agree that CFCs represent the major environmental threat in the PC business. IBM is also working to reduce its energy consumption, and companies such as Compaq design their buildings with the environment in mind.

Their vigilance will be needed. As portable, battery-powered computers become more widespread, manufacturers will face the issue of nickel-cadmium batteries, which power most portables and present an environmental hazard because of their cadmium content. Major laptop makers such as Compaq and Groupe Bull subsidiary Zenith Data Systems are investigating nickel metal hydride batteries as a replacement for nickel-cadmium batteries, in part because metal hydride presents less of an environmental hazard. Toshiba America Information Systems, Inc. recently introduced portables that use metal hydride batteries.

Fast performance

CONTINUED FROM PAGE 63

time. There is considerable debate as to which method is easier to program for.

Still, hardware vendors are optimistic that the software hurdle can be overcome through a wider availability of compilers and an increasing momentum toward using standard operating systems and interfaces, among other factors.

The application that will trigger the corporate market will probably be content-sensitive text retrieval, according to Bill Hogan, vice president and general manager at Maspar in Sunnyvale, Calif. Not long ago, Maspar inked a pact with DEC under which DEC will resell Maspar machines.

Corporate databases are filled with text, but not necessarily information, Hogan said. Other promising areas include image processing and database management query systems, he said.

An added plus is that parallel machines readily plug into standard networks and interconnectivity is not a problem, Hogan said.

He envisioned that some corporate early adopters will use massively parallel processing computers as file servers and attach them to networks to run tasks for which the machines are best equipped in the background while the host system handles the primary applications.

EXECUTIVE CORNER
Lukens on top as Watch Hill CEO

Industry veteran **Matthias Lukens, Jr.** last week was named president and chief executive officer of East Greenwich, R.I.-based **Watch Hill Research, Inc.**, the data communications start-up he co-founded with **David W. Clarke**, who will serve as vice president of sales and marketing. Watch Hill is introducing what it claims are the world's first data compressors for high-speed T1 leased lines. Lukens has also been instrumental in the launching of network products vendor Reif Communications, computer-aided software engineering tools maker Cadre Technologies and high-tech consulting firm Rubicon Consulting.

Bruce Simpson, former vice president of finance and administration at Dallas-based voice messaging network provider **Tigon**, is the firm's new president. Simpson, who joined Tigon in January 1990 from a controller's position at parent corporation Ameritech, succeeds John Beletic, who is taking a year's leave of absence to serve on the boards of several companies.

Experience a key for opening IS doors

BY LUCIE JUNEAU
SPECIAL TO CW

Information systems hiring managers report that tight budgets and short project time frames are causing them to favor experience over enthusiasm when looking to fill staff positions.

Professionals with at least four years of experience in IS are being hired over rookies straight out of college because managers want workers who can produce results quickly.

Although experienced talent often comes at a premium price, managers won't sacrifice their requirements. "Money's an important issue, and employers will try to save where they can. But if it's a certain set of skills they're after, they won't sacrifice that to save a dollar," says Steve Fogle at recruitment firm Korn/Ferry International in San Francisco.

For example, if a manager is allotted one new hire and has a choice of bringing in someone with experience at $40,000 or someone without experience at $25,000, the $40,000 candidate will generally get the job, says Rick Bawsel, staffing manager for General Electric Consulting Services Corp. in Atlanta. "If you have one slot open, you're going to go for the biggest bang you can get," he says.

Experienced IS workers are also perceived as good buys by employers who believe they'll need little or no training.

These days, finding the money to fund training programs is difficult, and with staff levels shrinking, managers can't afford to take time out to supervise workers closely.

Working managers

"I see more and more managers turning into working managers. They're not there just to administer and delegate: They have their own work product to generate," says Cissy Van Balen, president of recruiting firm King and Van Balen, Inc. in San Francisco.

This is good news for seasoned IS professionals, Van Balen says, because working managers need people who can operate independently. "With an experienced individual, you say 'Here's what we're trying to achieve,' and that person can be cut loose to go do it," Van Balen says.

Managers do admit that one disadvantage in hiring experienced personnel is that they are predisposed to certain technologies and aren't as open-minded as entry-level workers. "Experienced professionals are a little more rigid in their thinking," says Brian Ellis, director of IS at Muskegon, Mich.-based Brunswick Bowling and Billiards Corp.

That one negative is far outweighed in most managers' minds, however, by a number of concerns about less experienced workers. Entry-level workers are generally dissatisfied with the money they're making, they're not equipped with enough solid business experience, and they're more apt to switch jobs early in their careers, managers say.

"You might get two years out of them, and maybe six months of that was spent in training," says Don Race, director of IS at Cedar Fair, L.P., an amusement park business in Sandusky, Ohio.

The main reason that entry-level workers don't stick around for long periods of time is because of the low pay, managers admit. But to bring productive rookies along financially as quickly as they deserve is difficult. Some companies have rigid corporate policies that won't allow managers to bump up salaries quickly enough, says Edward Perlin, president of Perlin Associates, compensation consultants in New York.

Consequently, companies that don't compensate their rookies for what they are worth face a high risk of losing them, according to Race.

"Not too many years ago, we hired a high school graduate at $5 an hour. He progressed at an unbelievable rate," Race says. "Unfortunately, I wasn't able to pay him as much as I should have. He left here to take a position that paid $40,000." Subsequently, Race had to hire two people to replace him. Their combined salaries came to more than the $40,000.

Another strike against rookies is that lack of experience equates to less than perfect work. "By getting nonexperienced data processors involved in design efforts, for instance, designs are sometimes a little off the mark. Because these professionals don't have 10 years of IS experience, they don't understand some of the constraints," says Larry Potter, director of IS at American Industries, Inc. in Portland, Wash.

Little to choose from

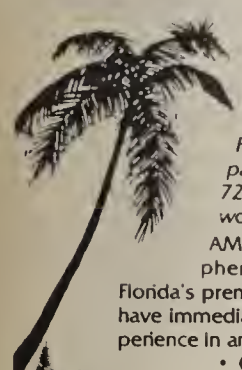
What all of this translates into is slim pickings in the job market for rookies.

"The person coming right out of college is having trouble finding a job," Fogle says.

However, a select few stand by their rookies. "If you give people the opportunity to follow the career path they'd like, they'll give you the extra mile to help make it a success," Potter says.

Some managers say that inexperienced professionals are more likely to get noticed if they have internship or work-study experience on their resume. These programs allow employers to evaluate students as future employees while students evaluate them as potential employers.

Juneau is a free-lance writer and editor based in Salem, Mass.



Florida
DON'T DREAM THE LIFE, LIVE THE DREAM!!!

Florida, with gentle winds bending the palms and an average temperature of 72°, is one of the finest places to live and work.

AMD Consulting Services is experiencing phenomenal growth. Our customers, Florida's premier information processing centers, have immediate needs for professionals with experience in any of the following:

- COBOL, PLI, ALC, RPG3, "C", CICS
- FOCUS, ORACLE, INFORMIX
- DB2/SQL, IDMS, M204, IMS
- TANDEM COBOL, TAL, PATHWAY
- DEC/VAX, UNIX, AIX, OS2, PICK
- PCS/ADS, MCCORMACK & DODGE

It's your move, make it the RIGHT ONE.

AMD CONSULTING SERVICES
One Harbour Place, Suite 885 C, Tampa, Florida 33602
(813) 229-9208

$45,000 to $60,000
DBA's/DATA MODELERS PROGRAMMER/ANALYSTS
DB2/IMS/CICS

Recent acquisitions have resulted in the immediate need for experienced DB2-DBA's and Data Modelers and also Programmer/Analysts with DB2/IMS DB/DC or DB2/CICS experience in the Louisville, KY and Cincinnati, OH areas.

Experience in large IBM environments utilizing Database and/or Data Communication products is preferred. We are developing large DB2 applications and seek individuals with a sincere desire to utilize current skills and realize their growth potential.

For consideration, send resume or call: **TCI, 2020 Meidinger Tower, Louisville, KY 40202, (502) 589-3110, FAX (502) 589-3107**

Every Employer & Computer Professional Really Needs TWO Employment Firms: One Local . . . One National

Every One of Us Offers You BOTH!

We're a network of independent employment firms who believe that every employer and every computer professional needs and deserves access to the broadest possible spectrum of candidates or job openings—wherever they are, locally and/or nationally.

Individually, our recruitment and placement experience within your own geographic area can save you valuable interview and relocation time and expense.

Collectively, our coast-to-coast National Computer Associates partnership enables you to reach beyond your own local market, whenever necessary, to find precisely the right skills or career opportunities.

NCA's current local and national active files contain professionals ranging from top-level executives to specialists in every discipline, each identified and qualified by an NCA professional. Meanwhile, our shared job-listing resources offer literally hundreds of current career openings across the nation.

We invite you to tap our combined recruitment and placement resources for all of your employment needs.

TAP INTO THE BEST OF BOTH EMPLOYMENT WORLDS! CALL OR SEND YOUR JOB ORDER OR RESUME TODAY.

ATLANTA: DataPro Personnel Consultants
#430, 1050 Crown Pointe Pkwy., Atls, GA 30338
(404) 392-9990 • FAX (404) 392-1177

BOSTON: Robert Kleven & Co., Inc.
P.O. Box 636, Lexington, MA 02173
(617) 861-1020 • FAX (617) 861-1047

CHICAGO: Career Consultants, Inc.
414 Plaza Drive, Westmont, IL 60559
(708) 986-1752 • FAX (708) 986-1762

CINCINNATI: Task Group
1429-B, Springfield Pike, Cincinnati, OH 45215
(513) 821-8275 • FAX (513) 821-8311

CLEVELAND: Innovative Resources Corp.
1340 Depot St., #210, Rocky River, OH 44116
(216) 331-1757 • FAX (216) 331-3499

COLUMBUS: Michael Thomas, Inc.
#340, 450 W. Wilson Bridge Rd.,
Worthington, OH 43085
(614) 846-0926 • FAX (614) 847-5633

DALLAS: DataPro Personnel Consultants, Inc.
#2001, 13355 Noel Road, Dallas, TX 75240
(214) 661-8600 • FAX (214) 661-1309

DENVER: Abacus Consultants, Inc.
#404, 1777 S. Harrison St., Denver, CO 80210
(303) 759-5064 • FAX (303) 759-9846

FLORIDA: Michael James & Associates
#309, 28050 Hwy. 19 N., Clearwater, FL 34621
(813) 796-6907 • FAX (813) 791-4850

GREENSBORO: DataMasters
P.O. Box 14548, Greensboro, NC 27415-4548
(919) 373-1461 • FAX (919) 373-1501

HOUSTON: Career Consultants, Inc.
#1050, 1980 Post Oak Blvd., Houston, TX 77056
(713) 626-4100 • FAX (713) 626-4106

KANSAS CITY: DP Career Associates
#502, 6405 Metcalf, Shawnee Mission, KS 66202
(913) 236-8288 • FAX (913) 236-9748

LOS ANGELES: Superior Resources, Inc.
#200, 6016 Fallbrook Ave.,
Woodland Hills, CA 91367
(818) 884-3000 • FAX (818) 884-3454

MEMPHIS: Information Systems Group
#417, 4646 Poplar, Memphis, TN 38117
(901) 684-1030 • FAX (901) 684-1068

MILWAUKEE: EDP Consultants, Inc.
P.O. Box 26066, Milwaukee, WI 53226
(414) 797-8855 • FAX (414) 476-7972

MINNEAPOLIS/ST. PAUL: ESP, INC.
#1800, 701 4th Ave., S., Mpls., MN 55415
(612) 338-6714 • FAX (612) 337-9199

NEW JERSEY: Systems Search
2040 Millburn Ave., Maplewood, NJ 07040
(201) 761-4400 • FAX (201) 761-0128

NEW YORK CITY: Botal Associates, Inc.
#410, 7 Dey Street, New York, NY 10007
(212) 227-7370 • FAX (212) 964-5033

PHILADELPHIA: Systems Personnel, Inc.
115 West Stale Street, Media, PA 19063
(215) 565-8880 • FAX (215) 565-1482

PHOENIX: Prof. Career Consultants
7501 E. McCormick Pkwy., Suite 110 South
Scottsdale, AZ 85258
(602) 274-6668 • FAX (602) 443-8489

PITTSBURGH: Alzed Enterprises, Ltd.
4 Gateway Center, Ste. 205,
Pittsburgh, PA 15222
(412) 261-7200 • FAX (412) 392-2365

ROCHESTER: Traynor Confidential Ltd.
#400, 10 Gibbs St., Rochester, NY 14604
(716) 325-6610 • FAX (716) 325-1077

SAN DIEGO: Technical Directions Inc.
#1025, 8880 Rio San Diego Drive,
San Diego, CA 92108
(619) 297-5611 • FAX (619) 297-6951

SAN FRANCISCO: Professionals For Computing
#1850, 455 Market St., San Fran., CA 94105
(415) 957-1400 • FAX (415) 957-0166

SEATTLE: Houser, Martin, Morris & Assoc.
#503, 110-110th Ave., N.E., Bellevue, WA 98004
(206) 453-2700 • FAX (206) 453-8726

ST. LOUIS: Executive Career Consultants Inc.
#100, 795 Office Pkwy., St. Louis, MO 63141
(314) 994-3737 • FAX (314) 994-3742

SYRACUSE: Information Systems Staffing
4933 Jamesville Rd., Jamesville, NY 13078
(315) 449-1838 • FAX (315) 449-1939

WASHINGTON, DC: Vista Computer Services
4350 Fairlakes Court, Suite 150
Fairlax, VA 22033
(703) 222-1900 • FAX (703) 222-1930

AUSTRALIA • LONDON • TORONTO:
For information, contact U.S. firm nearest you.

Ask for your FREE copy of our 1991 Salary Survey

National Computer Associates

MANAGING YOUR CAREER

Martin A. Morris Jr.

Preparation key for successful interviewing

During a recent visit to an art museum, I found myself strolling through the various exhibit rooms, looking at the photographs, paintings and sculptures without any particular objectives in mind for learning more about the artist or the history related to the item I was observing.

After leaving the museum, I felt quite strange about having allowed my mind to remain fairly unfocused.

But that was what was called for at the time: a relaxed and unstructured approach that permitted me to observe, review and later analyze the objects in the museum.

A job interview, on the other hand, is anything but a stroll through a museum. However, too many applicants for information systems positions don't seem to know the difference. They think that as long as they dress appropriately, look presentable and are able to name the various languages and software products with which they are familiar, they will do quite well during an interview.

The reality is that unless candidates begin to understand how to handle a job interview and the details leading up to it, they aren't going to be offered jobs.

That's why IS applicants must apply a bit of thought and research prior to the interview. By taking the following steps, an IS candidate will be prepared to ask pertinent questions about the job or company.

This will put the candidate several strides ahead of his competitors:

Visit the local library. A library can offer a wealth of information about a company: length of time it has been in business; type of business; headquarters location; number of employees; forms of similar business activity in the region; international operations information; and profitability data.

With regard to the type of business the firm engages in, you may want to determine whether any or all of the IS work depends on U.S. Department of Defense contracts.

This could have a major bearing on the geographic location of the job, as well as the length of time for which the job or contract exists.

Review the financial pages. While a city's major daily newspapers may have some pertinent details about the company in which an IS candidate is interested, financial publications such as *Barron's* and *The Wall Street Journal* will have the most comprehensive information.

This information could include closing stock price and how much it was up or down compared with the previous day's close; reports of market trends in its line of business; and whether the Federal Reserve Board's monetary policy will impact the company's ability to expand its current level of operations in the foreseeable future.

Prepare a list of questions to bring to the interview. There are several questions IS professionals can and should ask during an interview. They may not have the opportunity again until a job is offered (assuming one is offered), and then it may be too late to do anything about it.

The following are some standard and informational questions to ask:

- In the proposed position, what kinds of activities are performed on a typical day? Who are the users of this system?
- For a person coming from outside the organization, what are the prerequisites and requirements to perform this job?
- What type of job responsibilities must a current employee have that might lead up to this job?
- What is the top job a professional can hope to achieve in this department?
- What specific types of training does the company provide for continued proficiency in this job (both IS and applications training)?
- What are the company's current and future directions with regard to IS?
- What aspects of this job might require special skills over and above those expected of most IS technicians? Namely, does the position require exceptional written and verbal presentation skills?

Talk to current and former employees of the company. Ask these people what they enjoy about their jobs and the work environment and what features about the job they feel could be improved. This is an unofficial but invaluable source of information for a prospective employee. Don't overlook it.

> UNLESS CANDIDATES begin to understand how to handle a job interview, they aren't going to be offered jobs.

An IS job hunter might not see the point in all this research. But he should remember this: The company at which he is interviewing is probably where it is today because of the IS applications that support and maintain its primary line of business.

His demonstrated interest in these measures of the firm's overall health will very likely be interpreted as a genuine concern for how he might best contribute to the business objectives.

Morris is an assistant vice president of IS at Amsouth Bank in Birmingham, Ala.

IS managers and corporate hiring managers: If you have a career issue you'd like to write about, please fax your idea to Cathy Duffy, (508) 875-8931.

Network Research Engineer

The Cleveland Clinic Foundation (CCF), an internationally renowned health care leader in tertiary patient care, education and research, seeks a key individual for a Network Research Engineer position. This individual will be responsible for evaluating, designing and implementing new technologies in our campus-wide data, video and voice networks.

CCF currently supports a wide variety of computing platforms communicating over several campus-wide networks including: asynchronous/ascii, SNA/SDLC, Ethernet and Token-Ring utilizing a common broadband backbone. The Clinic also supports remote data and video-conference services. Our focus over the next year will be to migrate to an FDDI backbone utilizing TCP/IP to enhance information exchange between dissimilar systems.

Applicants must have extensive knowledge and experience in network design, performance/capacity planning and network management systems. Experience with Unix and/or an understanding of the health care environment would be beneficial. A BSEE or a Bachelor's Degree in Computer Science or a related field is a requirement.

Interested candidates please call Chris Barendt, Network Manager at 216-444-0023 for further details, or send resume to Patricia Novak Human Resources Department, The Cleveland Clinic Foundation, One Clinic Center, 9500 Euclid Avenue, Cleveland, Ohio 44195.

THE CLEVELAND CLINIC FOUNDATION

An Equal Opportunity Employer M/F/H/V • Smoke-Free Environment

FREE NATIONWIDE HOUSING NETWORK

If the high cost of hotel or other short-term housing is limiting your job search, access the LodgInc *Nationwide Housing Network – free.*

- Find affordable short-term housing in corporate-style apartments.
- Save up to 50% over hotel costs!
- Benefit from the largest data base of corporate housing in the country.
- Individual, personalized service.
- Absolutely *free* – no cost / no fee.

LodgInc is a unique and independent company that can access literally thousands of corporate housing facilities in the U.S. through its national network.

For more information call 617-397-0190. Toll free: 800-525-5412.

LODGINC
NATIONAL CORPORATE SUITES NETWORK
33 Dartmouth St., Malden, MA 02148

Data Processing

EDP AUDITOR

Maytag, a $3 billion-a-year Corporation devoted to the manufacture and sale of high quality home appliances and floor care products, with 22 manufacturing operations in seven countries, has an outstanding opportunity for an EDP Auditor. This highly visible position will be located at our Corporate headquarters in Newton, Iowa. (Located 30 miles east of Des Moines.) Travel will be approximately 35%.

Qualified candidates should possess a four year college degree along with 2-5 years experience in EDP auditing, systems development and/or computer operations in large mainframe/mid-range computer environments. In addition, candidates must have exceptional written and oral communication skills. CISA certification is a plus.

We offer an environment that encourages innovation and rewards individual contributions and a highly competitive salary/benefits package. Send your resume with salary history and requirements to: Anne Wignall, MAYTAG CORPORATION, 403 W. 4th St. No., Newton, IA 50208.

MAYTAG CORPORATION
An Equal Opportunity Employer M/F

THE ROCKIES

PRODATA/PRO-STAR provides consulting services to Industry & Government throughout the Western U.S. We offer full time, salaried employment with excellent benefits (inc. 401K), relocation assistance, and long term career growth opportunities. Our **Salt Lake City** office currently seeks:

- Adabas/Natural: w/CICS; Gov't exp. a plus.
- CASE: Texas Instruments; Knowledgeware
- SYNON II; RPG III a plus.
- IMS/DB/DC/DL1; DB2/CICS
- Honeywell TDC/3000

(Our **San Diego** office also needs: C, OS/2, DB2, CASE, IDMS, HOGAN, and MUMPS). Please respond to:

PRO-STAR
5282 S. 320 W., #D-100, Salt Lake City, UT 84107
(801) 266-6138

Sunbelt Opportunities

TELON Prog/Anal's	34-43K
ASSEMBLER Prog/Anal's.	30-35K
DB2/SDL Prog/Anal's.	30-40K
CICS Prog/Anal's	30-37K
IMS DB/DC Prog/Anal's	30-37K
PL/1 Prog/Anal's	32-36K
IDMS-ADS/D Prog/Anal's	32-38K
FOCUS Prog/Anal's	33-40K
AS/400-S/38 Prog/Anal's	30-38K
TANDEM Prog/Anal's.	30-40K
HP 3000-COBOL Prog/Anal's	30-37K
VAX/CDBOL Prog/Anal's.	32-36K
ADABAS/NAT Prog/Anal's.	30-37K
ORACLE/SDL Prog/Anal's	35-45K
MSA or M&D Prog/Anal's.	33-45K
OB2 or IMS DBA's	40-53K
EDP Auditors	33-46K

North Carolina's largest employment agency, in business since 1975. 300 affiliates. Opportunities in the Southeast and nationwide

Corporate Personnel Consultants
3705-320 Latrobe Drive, Box 221739
Charlotte, NC 28222 (704) 366-1800
Attn: Rick Young, C.P.C.

Why WTW?

Because You're The Best

Wesson, Taylor, Wells one of the nation's premiere software consulting firms – has challenging careers across the country for top programmer/analysts with application development expertise.

DEC VAX, SMARTSTAR Rdb or Oracle

Send resume immediately or call:

Wesson, Taylor, Wells
P.O. Box 158824
Nashville, TN 37215

1-800-833-2893

WTW SOFTWARE CONSULTING SERVICES

An Equal Opportunity Employer

Technical Product Support
Wayne, PA

At Micro Focus, we develop and sell the world's leading application development software for professional COBOL programming.

Working in our Wayne, PA support center, you will provide technical support via telephone to customers throughout the eastern United States. You will track, isolate and report customer problems, issue corrections and provide account status reports to management.

The ideal candidate will have a BS/BA, or equivalent, and 5+ years of programming experience in COBOL and one or more of the following: CICS, SQL, PC/DOS, OS/2, LAN, IMS or IBM mainframe COBOL environments. Excellent communication skills essential.

We offer an attractive salary and bonus compensation package. For immediate consideration, please send or fax your resume to: Micro Focus, Attn: Debra Machado, 2465 East Bayshore Rd., Suite 400, Palo Alto, CA 94303. Fax: 415-494-1505. Principals only, please. EOE, M/F/H/V.

MICRO FOCUS®
A Better Way of Programming™

1991 MIS

SHARPEN YOUR TECHNICAL EDGE Bay State Health Care is New England's largest network HMO. And we're growing. To meet the challenge of serving 350,000 members and 6000 doctors, we're upgrading our Management Information Systems in order to construct a state-of-the-art capability which will lead to paperless insurance claims. By joining the team of professionals at Bay State, you can play a vital role in this exciting technological development. Move into a fast-paced, expanding operation that will keep your skills at their sharpest.

TECHNICAL SPECIALIST As part of our new Technical Services Department, you will help provide technical leadership support and consultation to the Systems Development staff. You will be responsible for installing, supporting and enhancing UNIX on multiple platforms as well as for working with Applications Personnel in identifying and troubleshooting bugs and other technical issues that arise. The ideal candidate will have 3-5 years' experience in UNIX, PICK Basic, C shell scripting, C programming and TCP/IP. Specific experience in system administration, performance analysis, troubleshooting and security required.

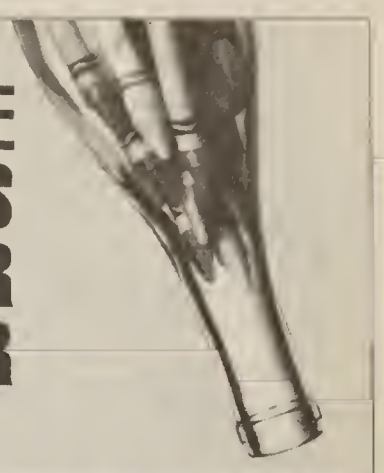
Bay State Health Care offers competitive salaries and an exceptional benefits package including free health insurance starting on your first day of employment, tuition reimbursement, profit sharing and a 401(k) plan.

For immediate consideration, please fax your resume to Suzanne Steen at (617) 499-5962, or send it to Bay State Health Care, 101 Main Street, Cambridge, MA 02142. An affirmative action/equal opportunity employer. We offer a smoke-free environment.

BAY STATE HEALTH CARE
THE DOCTORS PLAN

YOU DESERVE THE BEST TREATMENT

ELIMINATE THE BOTTLENECKS IN YOUR CAREER



EMC Corporation supplies innovative, high-performance storage products and related services for midrange and mainframe computers worldwide. Traded on the NYSE, EMC was the 4th largest percentage gainer during 1990 and had revenue growth of 29% and stock growth of 146% over the previous year.

POST SALES SYSTEMS ENGINEER
Provide high level of support for IBM Mainframe and DASD products. Must have experience with VM/MVS, and the ability to function at the customer MIS Director level. BSEE or equivalent, along with 5-10 years experience in VM/MVS, and field support.

CUSTOMER ENGINEERS
Excellent communication skills required to interface with customers and analytical skills to diagnose problems. ASEE or equivalent, along with 2 years experience in computer maintenance of IBM midrange or mainframe DASD products.

EMC Corporation provides excellent salaries and benefits including medical/dental, tuition reimbursement, profit sharing, 401K plan, ESPP, vacation and sick days. Please send or fax resume with salary requirements to Deborah Kanter, Employment Manager.

EMC²
EMC Corporation
171 South Street
Hopkinton, MA 01748-9103
Fax (508) 435-7954
(Principals Only Please)
An Equal Opportunity Employer

PROGRAMMERS

- IMPRESSIVE TECHNOLOGY
- PROGRESSIVE OPPORTUNITIES
- AGGRESSIVE COMPANY

- PACBASE
- TELON/DB2
- CICS/DL 1
- VAX/COBOL
- UNIX/C
- SUN/XWINDOWS
- IMS/DB2

Florida, Atlanta and Hartford.

Be a part of an Employee Owned Company!

1-800-552-CMSI

CMSI Computer Management Sciences, Inc.
8663 Baypine Rd., • Jacksonville, FL 32256

MANAGER
Technical Training

Responsible for the planning, development and execution of effective company wide technical training programs. Will consult with top management on the development implications of proposed changes in technology. Be actively involved in the evolution of Project 2000-our multi-year, multi-million dollar commitment to advanced technology. Consult with users regarding technical training efforts to include core mainframe systems, PCs and workstations.

Position calls for a graduate degree or equivalent; 5-7 years stand-up instruction experience in a hands-on environment (including C, SyBase, and UNIX); and at least three years successful technical course design. Ability to demonstrate excellent consultation, platform and group facilitation skills as well as strong management and planning skills also required.

We offer a highly competitive salary, stock ownership, 401(k) matching, tax-saver spending account, educational assistance, employer-assisted housing, free parking and more. Send your resume to: Fannie Mae, Dept. DH-24, P.O. Box 39192, Washington, D.C. 20016. For more opportunities, call our Job Hotline at (202)752-5300.

Fannie Mae is an Affirmative Action/Equal Opportunity Employer. We invite inquiries and applications from minorities, women, veterans and members of other protected groups. We promote a drug-free work environment

FannieMae
The USA's Housing Partner

NY/NJ/PA/CT/FL/DC
CONSULTING OPPORTUNITIES

Immediate F/T and Consulting Positions Available:

TANDEM
GUARDIAN, SCOBOL, PATHWAY or INTERNALS
MENLO, EXPRESSWAY

UNIX/C/SYBASE

DB2/IMS/CSP

LANCASTER SYSTEMS, INC.
1600 Harrison Avenue
Mamaroneck, NY 01543
(914) 698-6869
or
308 Wall Street
Princeton, NJ 08540
(609) 497-4918
FAX (914) 698-5556

IS Journalist

WANTED: Information Systems Journalist interested in making (not just reporting) news. Fulfill your intellectual curiosity by identifying and interviewing experts in all areas of IS and sharing those innovative concepts with top-level executives via broadcast journalism. Publish articles at the leading edge of management theory and practice. Maintain industry-wide press contacts. Bring your experience, enthusiasm, and creativity to our high-performance team at N. Dean Meyer and Associates Inc. Send resume and writing samples to NDMA Inc., 641 Danbury Road, Suite D, Ridgefield, CT 06877.

A Terrific Opportunity

Computer Consulting Group, has immediate openings on its consulting staff for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits. We're especially seeking:

- MVS SYS. PROG.
- VAX/RDB
- INTERGRAPH
- IMREX
- STRATUS
- NATURAL 2
- DB-2/IMS

Computer Consulting Group
Contract Professional Services

Servicing the Research Triangle Park and the Southeast area.
4109 Wake Forest Rd.
Suite 307
Raleigh, NC 27609
1-800-222-1273
FAX (803) 738-9123
Member NACCB

Data Processing

IS PROFESSIONALS

Opportunities abound in the Southeast for talented, experienced (3 years minimum) Programmers, Senior PA's and DBA's. Join our talented staff and work in state-of-the-art environments on challenging projects. Current opportunities for '91 include:

- CICS, IMS, DL/1
- VAX, Fortran, Ingres
- CICS, IDMS, DB2
- AS400, RPG III
- Natural, Adabas
- Adabas Systems Programmer
- DB2 Data Analyst
- CICS, CSP, DB2
- CICS, IMS, DB2
- IBM Fortran, Cadam

We offer excellent compensation, relocation assistance, full benefit package and education reimbursement. Send your resume TODAY!

AMERICAN COMPUTER PROFESSIONALS
140 Stonendge Drive
Suite 350
Columbia, SC 29210
(800) 933-9227
Fax (803) 779-1955
equal opportunity employer

EXCITING OPPORTUNITIES

We have grown over **25%** during the past year despite the recession.

CMA CONSULTING SERVICES is an innovative software development and consulting firm with offices in upstate New York, Vermont, and Florida. Our national exposure and involvement in state-of-the-art development projects has helped create more opportunities. To respond to such exceptional growth, CMA needs talented individuals with the following skills:

DATABASE TECHNOLOGIES
MODEL 204
ORACLE
DB2

DEVELOPMENT TOOLS
MUMPS
HOGAN
PARADOX

Please Fax or Send Resume to:
CMA CONSULTING SERVICES

14 Wade Road
Latham, NY 12110
(518) 783 9003
Fax (518) 783 5093

7300 West Camino Real
Boca Raton, FL
(407) 395 1331
Fax (407) 393 6082

76 Ethan Allen Drive
S. Burlington, VT 05403
(802) 860 7055

CMA CONSULTING SERVICES
Computer Solutions Since 1969

CONTRACT

Assignments Pa, NJ, Del & MD

- MSA HRMS
- Unix, C, ORACLE
- Unix System Administrator
- Unix C, TCP/IP, X.25
- Informix, Oracle
- Ideal, Datacom
- TDS Installer
- AS/400
- PLN, Norand
- PC-Express
- Mantis or Supra
- Nomad
- S/36, Cobol
- Pacbase

DEVON CONSULTING
435 Devon Park Drive
Suite 410, Box C
Wayne, PA 19087
Phone#:215-964-2700
Fax#:215-964-2708
Member NACCB

PROGRAMMER ANALYST (CONSULTANT) - With minimal supervision, provide programming analysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing applications. Develop and implement systems interface including systems database and program design, coding and testing enhancements. Develop, write, code and implement new application programs to meet current and projected client needs. Duties entail work with DEC, ULTRIX, ORACLE, C, SQL, DBA and Screen Interface Applications. Must have Bachelor's or equivalent in Computer Science or Engineering or Math. (Employer deems an Associate In Applied Science in Computer Science degree plus two years of professional paid experience as a Programmer Analyst or Software Specialist to be the equivalent of a U.S. Bachelor's degree in Computer Science.) Experience required is two years in job offered or two years as a Programmer Analyst or Software Specialist. Additionally, two years experience must involve the use of DEC, ULTRIX, ORACLE, C, SQL, DBA and Screen Interface Applications. M-F; 40 hrs/week, 8:00-5:00; salary $45,200/year. Cary, NC location. Must have proof of legal authority to work in the U.S. Send resume/ltr. in duplicate to Job Service, 700 Wade Ave., Raleigh, NC 27611. JO No. 7204864, DOT No. 012.167-066. EOE.

SYSTEMS ANALYST-design, develop, maintain system software for a large complex integrated Communication Management System on UNISYS 1100/2200 machines w/ UNISYS-1100 ASSEMBLER; implement network mgmt, security, & trouble shooting, performance evaluation; System will provide functionality w/ respect to SIMAN, PAR, RSS; Will enhance network protocols, routing algorithms, using optimal efficiency logic; interface with machines emulating UNISYS-1100/2200 using "C"; maintain internal database scheme for comm mgmt system; use comm modules such as MCB & TELCON for integrating wide area network concepts into Comm Mgmt System. Must have 6 mos exp as Systems Analyst or Systems Software Support; UNISYS large systems; RSS, PAR, SIMAN, CMS 1100, MCB, TELCON; "C" & UNISYS ASSEMBLER; excellent written & oral communication skills. Travel a must. Must have Masters Degree or completed course work for MS in Computer Science or MIS. $32,000 yr. Apply in person or send resume to Georgia Department of Labor, Job Order #GA 5492447, 2972 Ask-Kay Dr, Smyrna, GA 30082, or to the nearest Georgia Job Service Center.

CONTRACTS AVAILABLE

- Fixed-bid & hourly
- All technical skill sets
- Analysis & programming requirements

Send inquiries to:
DATAVANTAGE, inc
P.O. Box 442,
Milford, CT 06460
(800) 879-3108

IMMEDIATE OPENINGS
PROGRAMMERS/ ANALYSTS
in the following areas:
PERMANENT and CONTRACT

- **COMMUNICATIONS**
  - DATA-PC to Mainframe exp.
  - DATA-LAN to Mainframe exp.
  - VOICE-(VRU) volce response units
  - HLLAPI experience
- OPENINGS NATIONWIDE
- **PC EXPERIENCE**
  - MS DOS, "C" (Sequel services) Windows
- **IEF CASE TOOLS,** through construction. Assignments Dallas, Atlanta and East Coast cities. Long term potential.

Please call 212-684-3950, or FAX: 212-889-2694 Or Submit Resume To:
HANK WALSH ASSOCIATES
475 Fifth Ave, NY, NY 10017

COMPUTER PROFESSIONALS

Keane, Inc., a $95M data processing consulting firm, is expanding its Twin Cities branch. We are looking for Programmer/Analysts with the following technical skills at all levels:

• Telon • DB2 • Case
• BAL • CICS • IMS DB/DC

Keane is listed among Forbes & Business Week's "100 Best Small Corporations" and is publicly traded on the American Stock Exchange.

We offer DP professionals training in IMS, DB2, CICS and Case tools, along with our other employee benefits: Major medical, life & disability, company matching 401k, stock purchase, credit union, vision & dental, tuition reimbursement, pre-tax dependent care reimbursement and vacation condos.

Please call Doug Moore or Joe Fraser at 800-999-4581, FAX: 612-851-3201, or send your resume to their attention at: Keane, Inc., 2901 Metro Drive, Suite 525, Bloomington, MN 55425. Equal Opportunity Employer.

SYSTEMS ANALYST/CONSULTANT to provide specialized consulting at customer's location to analyze, design, test, and implement commercial Imaging systems for applications in the areas of Insurance, Banking, Finance, Health & Medical, Production Planning & Control, Personnel and Process-control using languages such as C, Cobol and Pascal, and utilizing tools such as DECimage, WIIS, Open/Image Windows, Metaview, Rdb, Oracle, PACE, Gupta/SQLBase, SQLWindows, DECwindows, X-Windows, Paradox, dBase, Banyan Vines, Novell Netware 386, Software for Scanner, Optical disk, OCR, Fax gateway, DEC-forms and VAX Rally on machines that include VAX 3300, 3100 under VMS/Ultrix, IBM PC 386/486 under MS-DOS/OS2, SUN under Unix, WANG 7010 under VS. Require: B.S. in Computer Science/MIS/Management of Technology and three years' experience (M.S. with one year's experience may be substituted for B.S. and three years' experience); 40% travel on 60-90 day assignments in the U.S. Salary: $35,000/year minimum. Apply with resume to: Georgia Department of Labor, 2811 Lakewood Avenue SW, Atlanta, Georgia 30315 or to the nearest Georgia Job Service Center. Job Order # GA 5494994.

PROGRAMMER/ANALYSTS
& SYSTEMS PROGRAMMERS

FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and data base applications P/A's as well as systems programmers and DBA's. Fee Paid Please call or send resume to:

Keith Reichle, CPC
Systems Search, Inc.
203 Heritage Park
Lake Wylie, SC 29710
803/831-2129

(Local to Charlotte, NC)

ASSISTANT DIRECTOR OF COMPUTER SERVICES

Responsible for managing Technical Support services, providing training, consulting, and help desk support to faculty and staff in the use of micro, mini, and mainframe computers. A Bachelors degree and at least five years of applicable experience required. Masters degree preferred. A minimum of two years in a supervisory or leadership position is required. Must have considerable experience with software applications for both micro and mainframe computers. Proven leadership ability and good communications skills are essential. Experience with Unix and DEC VAX/VMS desirable. Georgia Southern University, a unit of the University System of Georgia, is a public residential institution enrolling approximately 13,000 students. Minimum annual salary: $37,870. Application deadline: August 9, 1991. Submit resume and cover letter to: Personnel Services, c/o Assistant Director of Computer Services, Georgia Southern University, Landrum Box 8104, Statesboro, GA 30460-8104. Georgia is an open records state. AA/EOI.

RESEARCH TRIANGLE OPPORTUNITIES

• COBOL	• DB2
• IDMS	• HOGAN
• ORACLE	• DBA
• UNIX	• DEC VAX
• NCP/VTAM	• INGRES
• VAX SYSTEM MGR	• SYSTEMS PROGR
• M&D (D&B)	• AS 400
• MANUFACTURING	• RPG III
• INSURANCE	• INFORMIX
• UNIX ADMIN	• SAS
• DATA ADMIN	• CICS
• NETWORKS	• IMS

Local, Regional & National Positions

THE UNDERWOOD GROUP, INC.
3924 Browning Pl., Suite 7
Raleigh, NC 27609
(919) 782-3024
FAX (919) 783-0492

PERM/CONSULTING

MSA PAYROLL Programmer/Analyst & Jr. Programmer/Analyst
Excel. **Permanent Positions** in the Sunbelt for individuals with Management Science America - "MSA" Payroll/Human Resource, JCL, MVS, COBOL, VSAM & I.E. exp.

Permanent Positions/SW Florida
DB-2 INTERNALS - Systems Programmers - CICS, VTAM, IDMS Internals, Assembler, Systems & Software Development.

Consulting Assignments
D & B M&D & MSA Pkgs.,

mail or fax resume to:
CWS SYSTEMS, INC.
206 SCOTT AVENUE
SANFORD, FL 32771
FAX: 407-330-0080
PH: 800-752-8296

Data Processing

ATLANTA IS HOT

Expand your horizons, your salary, and your career

OS/JCL
COBOL
P/A's
LEARN DATABASE AND CICS

Great opportunities exist for ambitious hard working team players. Join "the" premier company in suburban Atlanta.

Call NOW for consideration and information: (404) 447-8848.

CM Solutions
3105 Medlock Bridge Road
Norcross, Georgia 30071
Fax (404) 242-0840

COMPUTER PROGRESS UNITED
$40,000 to $60,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for **P/A** in **Kentucky, Ohio, Indiana,** and **Tennessee. We are the DB2 Specialists!**

TELON
DB2 ■ IMS ■ CICS

Send resume or call:
Computer Progress United
12730 Townepark Way
Louisville, KY 40243
(502) 245-6533

ORACLE

Fast-paced software marketing and service company seeks a Programmer/Analyst with significant experience with Oracle. Unix, Ultrix, VMS experience helpful. Attractive compensation package. Send resume to: One LakePointe Plaza, 4235 South Stream Blvd., Suite 180, Charlotte, NC 28217. Attn: DM. Resumes without salary history will not be considered.

CONSULTANTS SHOULD CONSULT
MIMI
Great Consulting Assignments and Full Time Opportunities
Please send resume & call:
Mimi Simon Assoc
90 West St. Suite 1105, NYC 10006
(212) 406-1705
FAX (212) 406-1768

Data Processing Director for the City of Savannah. Department budget of $2.2 million, staff of 29+ presently converting from Unisys 1100 mainframe to an open architecture distributed network system. Master's degree in Computer Science or Public Administration + 5 yrs supervisory exp. in data processing system development and operations. Exp. with UNIX platforms, relational databases and distributed networks desirable. Salary Range: $48,775 - $57,857/yr. Send resume to City of Savannah Personnel Office, P.O. Box 1027, Savannah, GA 31402 by August 16, 1991. EOE.

Systems Analyst - Design, develop, customize and implement on-line technical and business applications for clients. Develop software utilities for IBM AS/400 system, write program and system specifications and enhance, test, and debug on-line systems. Involved in software development and Implementation. Utilize COBOL and CL programming languages. Requires working knowledge of IBM AS/400 system, utilizing COBOL and CL programming languages. 40 hr. wk. $36,000 per yr. Requires Bachelor's Degree - Computer Applications. 1 yr. exp. req. Send resume to Job Service of Florida, 105 East Broward Blvd., Fort Lauderdale, FL 33301. Attn: J.O. #0446307.

Programmer/Analyst - design, develop & maintain systems & databases; provide technical support; write specifications. Master of Science/Computer Science. 2 years experience in job offered or 2 years experience as Software or Systems Engineer. Applicants must have 1 year of experience using ORACLE, PRO-C, SQL FORMS, SQL Plus, PCs, VAX 11/780. 40 hr/wk (9am-6pm); $38,400 per year. Mail resume & copy of ad to: Dept. of Economic & Employment Development; 1100 N. Eutaw St., Rm. #212, Baltimore, MD 21201. JO#9048244. Job location: Rockville, MD.

THIS SPACE FOR HIRE

Call today to place your recruitment ad.

800-343-6474
in MA, 508/879-0700

Every week Computerworld delivers more qualified job candidates than any other newspaper.

That's why more companies place more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

To place your ad, call Lisa McGrath today at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

This Space for HIRE! CALL:

800-343-6474

in MA., 508-879-0700, ask for John Corrigan, Vice President Classified Advertising.

COMPUTERWORLD

Weekly. Regional. National.

And it Works!

Principal Software Engineer - Responsible for providing highest level of remedial technical support for customers worldwide using Digital/IBM networking products. Work with geographical customer support as well as directly with customers to manage report problems, add technical velue, & provide action plens leeding to resolution. Identify & isolete complex technical problems thet ere reported against the product through troubleshooting of Digitel & IBM computer systems (hardwere & VMS, ULTRIX, MVS & VM software). Reproduce customer problems in leb environment. Through analysis of communications protocols, use of various Protocol Analyzers & network menagement tools, es well es analysis of software, network treces, & crash dumps assist in providing final technical resolution to customer. Provide technical information (seminers & written documentetion) to customer support groups worldwide. Requirements: Bachelors degree in Computer Science plus 4 yeers experience or Associetes degree in Applied Science plus 6 years experience or equivelent in communications protocols, networking products & computer systems (hardwere & software) including 2 yeers of experience in direct customer support; Background in dete anelysis with multiple vendor protocol enalyzers, softwere enalysis & network menagement tools. Salary $56,659.20 per yeer. 40 hr/wk. 8:15am - 5pm. If you are interested in, & qualified for the above position, please forwerd two (2) copies of your resume to: J.O. #1507, Commonwealth of Massachusetts, Dept. of Employment & Training, Special Programs, first floor, 19 Staniford St., Boston, MA 02114. EOE.

SOFTWARE ENGINEER/COMPUTER CONSULTANT: Software Engineer/Computer Consultant needed to analyze clients' needs to determine the data processing system that will provide system capabilities required for projects or workloads. Determine, recommend, and plan the layout of computer and peripheral equipment to be installed or modify existing equipment, utilizing knowledge of XT, Fortran, Prolog, Lisp, Sun Workstation and DOS Kernel. Code and test tesks on changes on various application systems, based on the clients' needs. Test run programs and correct errors caused by incorrect programming. Analyze, review, and rewrite programs to increase operating efficiency or adapt to new business procedures. Plan and prepare technical reports, memoranda, and instructional manuals reletive to the operation of the program of system. Requires a Master's degree in Computer Science and three years experience in job offered or will consider a Bachelor's degree in computer science and five years experience in job offered or five years related hardware/software program design in lieu of Master's degree and three years experience. Experience must include et least one year experience in the following: C, Pescal, SmellTelk, and Unix Operating System as well es computer graphics, and RS232. 40 hour work week. $36,300 per year. Apply at the Texas Employment Commission, Dallas, Texes, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order #6122791. Ad paid by an Equal Opportunity Employer.

CA & AZ CONTRACTS

CONSULTANTS WANTED

P. Murphy & Associates, Inc.

4405 RIVERSIDE DR., SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122
Member NACCB

$100 - 150,000 PER YEAR

SR. Development IE Consultants
IEW/IEF/SYNON/
ORACLE/BACHMAN
Immediate IEF/CASE
Training for MVS
DB2/TANDEM/DEC/UNIX
P/A Developers

SALES/MARKETING
Software Product Developers
CASELOGIC is the premier consultancy networked/retained by several CASE Mfrs.
Your Choice: CASELOGIC or CASE DEVELOPER.
2 yr project in Tokyo · Needs in all US/Canadian cities.
Top Secret Clearances · ·
Forward resume:

CASELOGIC
2777 Stemmons Fwy #350
Dallas, Texas 75207
(214) 634-3418
FAX: (214) 634-3731
Contract consultants welcome

CALL US... Because Your Future Is Our Business

M.I.S. International is one of Michigan's oldest and most respected consulting firms. For over 20 years, we have provided top-notch data processing services to Fortune 500 firms including the major automobile manufacturers and suppliers.

We are enjoying exceptional growth in our Michigan, Ohio and California offices, making this a perfect time to step up to a permanent position on our technical staff. Currently available opportunities include:

- SIMAN or CINEMA or WITNESS
- ORACLE
- VAX PL/1
- VAX LISP, X-WINDOWS
- VAX RDB, RALLY
- TRANSACT
- IMS PL/1
- IMS DB2
- DOS/VSE COBOL & ASSEM.
- FOCUS

Call Marie Clark at **1-800-878-1118**, or forward your resume to: **MIS International Corporate Headquarters, 445 Enterprise Ct., Bloomfield Hills, MI 48302. FAX (313) 253-9506.** Equal Opportunity Employer.

MIS INTERNATIONAL INC.

Manufacturing Engineer responsible for the development & implementation of advanced manufacturing processes in surface mount technology (SMT). Involved in Machine Vision technology for automated inspection & Metrology as applied to electronics manufacturing. Develop mathematical models & software algorithms for Machine Vision as applied to process automation & metrology equipment. Develop/design statistical experiments for surface mount technology process development & automated assembly equipment, utilize quality engineering techniques such as Taguchi experimental design methodologies to characterize & optimize SMT assembly equipment & related processes. Design for Assembly & Manufacture (DFA/DFM) techniques for electronic modules product & process development. Technology investment analysis, application of artificial intelligence (AI) & LISP programming techniques, manufacturing process simulation utilizing application programming language (SLAM), possess computer literacy in the following areas: VAX family of minicomputers, application programming utilizing FORTRAN, PASCAL, C & BASIC language. Requirements for this position are: a Master of Science in Manufacturing Engineering with a background in Design for Manufacture & Assembly (DFA/DFM), Knowledge of Design of Experiment (DOE), Machine Vision applications for automation & Metrology, knowledge in VAX family of minicomputers, computer control of mechanical systems, manufacturing/assembly simulation using SLAM, Decision Support system tools, Artificial Intelligence (AI), Engineering Plastics. Salary: $36,254 per year. 40 hr/wk. 8:15am - 5pm. No exp. req. If you are interested in, & qualified for the above position, please forward (2) resumes to: Attention: Job Order #1633, Massachusetts Department of Employment and Training, Special Programs Unit, Charles F. Hurley Building, 19 Staniford Street, Government Center, Boston, MA 02114. EOE.

PROGRAMMER/ANALYST: Design, develop, implement and maintain software to support equipment tracking and utilization, yield and cycle time enhancements for computer aided manufacturing systems including process control software tools and scheduling systems. Design, optimize and maintain various hierarchical, relational and network database systems supporting production information including on-line specifications, document control and access to the mainframe database through cell controllers for real time data collection and database updates. Implement and maintain user interface in C and embedded DML for CODASYL Network Database. Provide real time/on-line computing support to the shop floor production personnel including design and implement statistical analysis software and material tracking systems. Evaluate third party software products and customize/modify and enhance them to meet Intel requirements. Advanced university level treining, research background or experience in the following: Information Systems including evaluation and design; Operating Systems, Decision Information Systems; Software Project Manegement; Database design and implementation using C and embedded SQL; design and implementation Group Decision support system end CAD releted projects; System implementation using Object Oriented Design Methodology. Proficient in C, C++, COBOL, BASIC, FORTRAN, VMS, DOS, DCL and INGRES. MS/Equivalent/Decision and Information Systems/$3220/month/Hrs: 8am-5pm/Job Location: Aloha, Oregon. Clip this ed and send with resume to Employment Division/Attn: Job Order No. 5550151/875 Union Street N.E. Room 201/Salem, Oregon 97311.

Systems Engineer - To propose and design the specification of operating software and the processor/memory architecture of the operating system kernel and the processor complex for e future generation of multiprocessor computer systems; to identify future market needs, and specify and architect systems that will meet these needs. Requires a PhD Degree in Computer Science, and in-depth understanding of computer architecture, operating systems, specification mechanisms and concurring models is required. Familiarity with performence evaluation of computer systems and modeling is important. Knowledge of the Unix Opereting System and C programming language is a prerequisite. Applicant must also have two years experience in the job offered or two years experience as a research essistant in software development in the Computer Science Department et e college/university. 40 hours per week, (work schedule: 8:00 a.m. to 5:00 p.m.). Salary is $59,000.00 per year. Must heve proof of legel authority to work permenently in U.S. Send resumes to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605. Attention: Maxine Counts. Reference #V-IL 2894C. **No Calls**. An Employer Paid Ad.

FLORIDA CAREERS

COMPUTERPEOPLE ... Florida's Premiere Firm serving Fortune 100 employers for their Consulting and Permanent staffing needs.

IBM MAINFRAME APPLICATIONS AND SYSTEMS

UNIX/C AND ADA SOFTWARE ENGINEERING PROJECTS

UNIX AND DISTRIBUTED PROCESSING ENVIRONMENTS

TANDEM SOFTWARE DEVELOPMENT

IBM MIDRANGE ENVIRONMENTS

If you are geared for career progression and are considering the state of Florida, contact any of our offices for additional information.

COMPUTERPEOPLE, Dept. 511
12225 28th Street N
St. Petersburg, FL 33716
813-573-2828

2005 W. Cypress Creek Rd., Ste. 3
Ft. Lauderdale, FL 33309
800-777-8803
305-771-8803

20 N. Orange Avenue, Ste. 1400
Orlando, FL 32801
800-888-1084

COMPUTERPEOPLE
"Your Next Job is Our Business"

SAUDI ARABIA

Tax free salary, free housing, 40 days vacation

SCECO

Saudi Consolidated Electric Company, Eastern Province, has the following immediate openings for qualified candidates

SYSTEMS PROGRAMMERS (OS)
MVS/(XA, ESA), JES2, ACF2, VTAM, TSO, NCP, and program support of CICS.

SYSTEMS PROGRAMMERS (CICS)
CICS (MVS/XA, ESA). Knowledge of CICS internals and externals.

SYSTEMS PROGRAMMERS (DB2)
Min. 3 yrs exp in maint., performance, recovery & tuning of DB2. CICS exp. a plus.

SYSTEMS ANALYST (ENG)
Min. 4 years experience in eng. applic. (Graphics) w/good command of FORTRAN, JCL and TSO/ISPF.

SYSTEMS ANALYSTS (BUSINESS)
Min. 4 yrs exp in the design, coding, and maint. of business applic. using COBOL (OS/MVS/CICS), DB2, VSAM, JCL, and TSO/ISPF. Working knowledge of SAS, EASYTRIEVE +, CENER/OL, COBOL/-XE, Data Modeling & install./maint. of CICS applic. pkgs, desirable.

Forward Resume & Salary History to:

SCECO
10700 N. Freeway, Suite 370
Houston, Texas 77037
FAX (713) 591-0921

VTAM DEVELOPMENT MANAGEMENT

SALARY TO $100,000

A super opportunity for a skilled manager with experience developing VTAM product software. A strong VTAM background and a proven record of successful software menagement is required. This position is with a mature firm with an established track record.

CICS PRODUCT DEVELOPMENT

SALARY TO $80,000

Expanding product development firm has an immediate need for an experienced CICS product development specialist. Must have five plus years of MVS assembly coding experience at the system level as well as CICS internals experience.

TECHNICAL WRITERS

SALARY TO $60,000

Our software development client has openings for technical writers with experience writing technical manuals for IBM operating systems, tools or products that are directed et systems programmers.

The company offers paid relocation and full suite of benefits.

ROBERT SHIELDS & ASSOCIATES
P.O. Box 890723
Houston, TX 77289-0723
FAX 713-486-1496
713-488-7961

CONSULTANTS

PROGRESS
DTM
UNIFY, C
ADA MVS
IMS TELON
PARADOX
VMS TEST
MVS Sys/P
SYBASE
COMPILER
IEF/IEW
STRUCTR4

COMSYS

Atlanta, Research Triangle, Phoenix & Weshington, DC

Dept. CW
P.O. Box 7947
Gaithersburg, MD
20898-7947
Fax:301/921-3670
800-9COMSYS

NACCB Member

data processing

INFORMATION SYSTEMS MANAGER

Miller Brewing, one of America's top brewers, has an exciting opportunity available at our Irwindale brewery. Incumbent will be responsible for the development, implementation and support for business and process automation systems in our small but innovative Information Systems Department.

The successful candidate must have a thorough knowledge of systems development methodologies and considerable supervisory experience of I.S. Professionals. The candidate's background should include a working knowledge of system analysis, programming, process automation systems, DIGITAL hardware configuration, and Local Area Networks. This should include a background in mainframe, mini and personal computer platforms. Knowledge of PLCs, Distributed Control Systems, and voice (phone) communication systems is a plus.

By joining Miller Brewing, you'll discover a highly professional work environment, as well as a competitive salary and an excellent benefits plan. For consideration, send your resume, with salary history, to: **Rick Salazar, MILLER BREWING COMPANY, 15801 East First Street, Irwindale, CA 91706.**

Employing and Promoting Equally Today and Tomorrow

MILLER BREWING COMPANY REMINDS YOU TO PLEASE THINK WHEN YOU DRINK

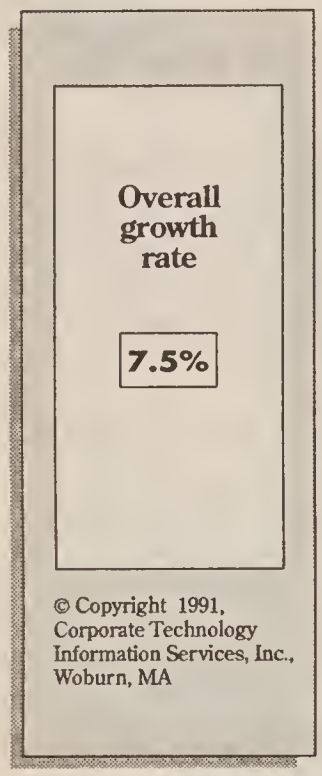
LOWENBRAU

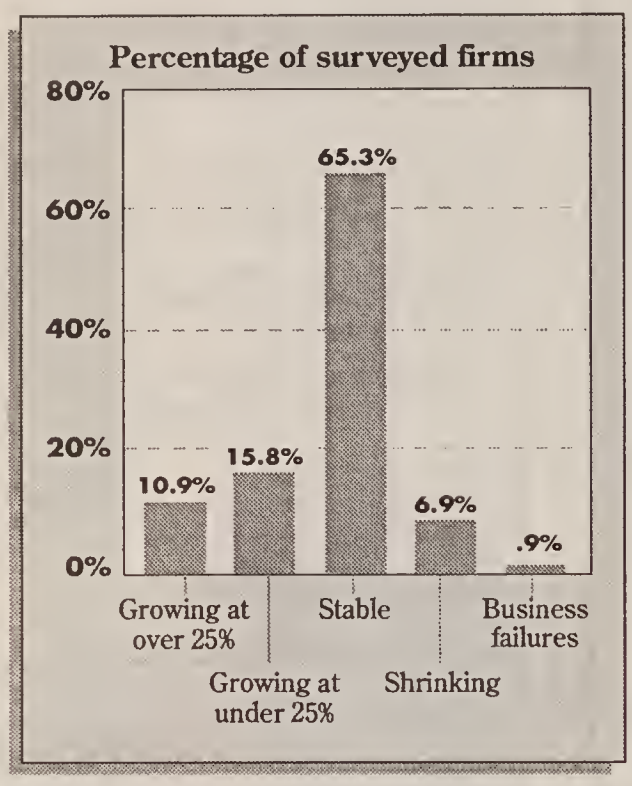
SOFTWARE ENGINEER - In a consulting environment partake in analysis, design, development, implementation & testing of required software. Requlre Bachelor's in Computer Science and 1 year experience including TANDEM (TXP and TNSII), COBOL II, TAL, and PATHWAY. Salary: $35,000 per annum. Job Site: San Francisco, CA. Resume to: Jackie Autry, 303 Sacramento Street, San Francisco, CA 94111.

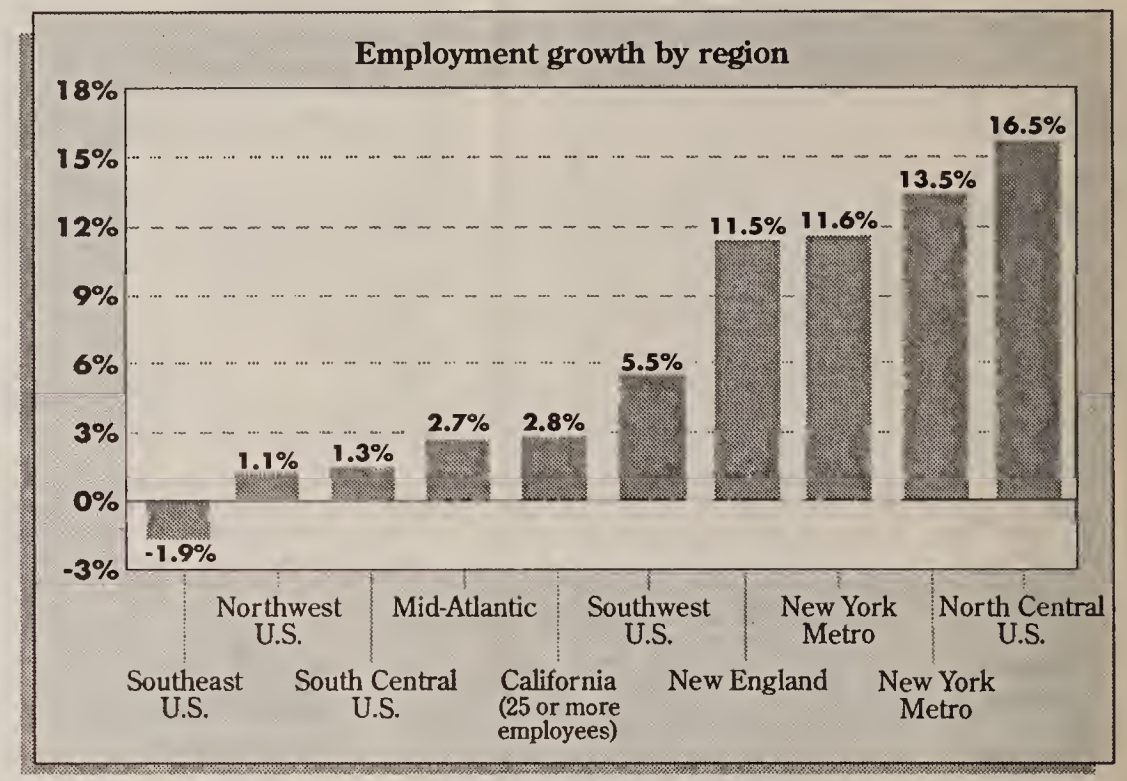
RESEARCH ENGINEER - M.S.E.E. with strong background in computer networking required (9 hrs. course work or 2 yrs. hands-on experience). Utilizing principles of Microprogrammed control for the Implementetion of digital hardware. Responsibilities include R & D for electronic publishing systems, microprocessor system design, computer interfacing and assembly language progremming. Must be knowledgeable in Microprogrammed Control of Digital Systems and VLSI Systems Design (3 hrs. course work or 1 yr. hands-on experience in each area). $29,000/yr., 40 hrs. wk. Must have proof of legal euthority to work permanently in the U.S. Apply at the Texas Employment Commission, Bryan, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texes 78778, J.O. #6122790. Ad Paid by an Equal Employment Opportunity Employer.

Computerworld/CorpTech Career Index

HEALTH SERVICES SOFTWARE COMPANIES — A survey of 101 small- and medium-sized firms finds that one quarter of them are experiencing employment growth, particularly in the Central United States







TANDEM
COBOL, PATHWAY,TAL, SCOBOL,C, SQL,X.25
STRATUS
PL1,COBOL,C,ON/2
Fulltime/Consulting Positions available in the US/ABROAD
VAX MUMPS ORACLE IBM
STRATEM COMPUTERS INC.
Call Irwin
800-582-JOBS
FAX (212)967-4205
124 W. 30th St. Suite #302
New York, N.Y.10001

Several contract and permanent positions available in Western United States for Data Processing Professionals with any of the following skills:

IBM COBOL, UNIX, C, VAX/VMS, DB2, CICS, IDMS, ADABAS, SYBASE, FORTRAN, ORACLE, ASSEMBLY, X.25 PROTOCALS, SAS, PASCAL, POWERHOUSE, COGNOS

Please call or send resume to:

Systems West
P.O. Box 11717
Salt Lake City, UT 84147
(801) 364-7900
FAX (801) 364-9700

IS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 629,000 computer professionals every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your advertisement.

For more Recruitment information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld recruitment advertising has a proven success record.

Just ask Linda Heubscher, Manager of Employment for a division of Unisys. It's her job to make sure that her division has the most qualified and technically trained personnel on its team. And for the most successful recruitment of these top computer professionals, Linda counts on Computerworld: "Our ads in Computerworld had the resumes pouring in and the phones ringing."

Or ask any one of the hundreds of companies who regularly use Computerworld to recruit qualified computer professionals. They'll tell you they advertise in Computerworld for one simple reason: **It works.**

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
Where qualified candidates look. Every week.

"...The largest percent of our advertising-generated leads come from one source - Computerworld's Marketplace Pages."

- Don Seiden
President
Computer Reserves, Inc.

In business since 1968, Computer Reserves, Inc. of Pine Brook, NJ, is the leading nationwide locator of computing services. According to President Don Seiden, the company acts as a broker of computer services, representing hundreds of data centers throughout the U.S. which have virtually every combination of hardware, software, and peripheral services to sell. Whether it's called remote computing, timesharing, or outsourcing, their mission is to help potential buyers locate data centers that best meet their exacting mainframe specifications in the areas of overflow, backup, disaster recovery, production, and software development.

"Our customer base includes just about everything from A to Z - small start-ups, government agencies, the Fortune 100, Big Six accounting firms, software developers, and manufacturing companies. Trying to reach every potential user of our services is where *Computerworld's* breadth and depth of coverage really pays off. I see *Computerworld's Marketplace Pages* being read by an excellent cross section of professionals - both decision makers and doers - who are in a position to use our services.

"For 10+ years, no other classified advertising vehicle, and we've tried them all, has been as fruitful as *Computerworld's Marketplace Pages* in delivering results. In fact, Computer Reserves is the oldest continuous advertiser in the Time/Services section because it's keyed directly to our business.

"Based on our volume of leads, we know that buyers who can use our services read *Computerworld's Marketplace Pages.* Since we carefully track every lead, it's clear that the largest percent of our advertising-generated leads come from one source - *Computerworld's Marketplace Pages.* And, with company placements and profits having grown tenfold since the mid-1980's, it's fair to say that a substantial number of these quality leads typically become productive business. As an extra benefit, *Computerworld's Marketplace Pages* have brought us many of our best service providers as well.

"I'm a firm believer in the value of advertising continuity, especially when there's an immediate need and high demand for value-added services like ours. I also believe that advertising should be commensurate with growth. Having orchestrated four major outsourcing placements in just 18 months, we need to maximize our exposure in the computing services marketplace. That's why Computer Reserves is now running in *Computerworld's Marketplace Pages* - our tried-and-true advertising platform - every week."

Computerworld's Marketplace Pages. It's where computer buyers meet computer sellers - every week. Sellers and buyers such as Computer Reserves, Inc. who advertise in *Computerworld's Marketplace Pages*, reach over 629,000 information systems professionals, and get results. To put your classified sales message into the hands of America's most influential buyers, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD
MARKETPLACE PAGES

Where computer buyers meet computer sellers. Every week.

A raft of Sun clones give users new choices

BY ALAN RADDING
SPECIAL TO CW

An ongoing issue for information systems equipment buyers is whether to stay with proprietary hardware or opt for a clone. Until recently, a choice hasn't existed for users of reduced instruction set computing/Unix-based workstations.

However, clones of Sun Microsystems, Inc.'s market-leading Sparcstation are now beginning to appear, and managers are finding they provide cost advantages and, in some cases, quicker product delivery and better performance than the real McCoy.

Currently available Sun clones include systems from Opus Systems in Mountain View, Calif.; Compuadd Corp. in Austin, Texas; Solbourne Computer, Inc. in Longmont, Colo.; and Mars Microsystems, Inc. in Wexford, Pa. More clones are expected to follow later this year, including one from Toshiba America Information Systems, Inc.

The No. 1 advantage to purchasing a Scalable Processor Architecture (Sparc) clone, according to users, is obtaining workstation power and functionality at a lower cost.

For example, TCI, Inc. in Mountain View, found the Opus machine to be about $3,300 less, says Terry Stiner, senior systems administrator. After testing one Opus clone, the company, which designs and builds large radio antennae, bought five more to add to its collection of Suns.

"There's a cost advantage to using a clone," says Dan Gauthier, director of MIS at Gulf Interstate Engineering in Houston. Gauthier brought in four Opus Personal Mainframe Sparc clones, which it uses as oil pipeline design workstations on a network with a Sun IPC server.

Gulf Interstate paid about the same amount for its Sun IPC as it did for the Opus clone, but Opus delivered a more powerful computer, Gauthier says. Gauthier's Personal Mainframes run at 18 million instructions per second (MIPS) vs. 16 MIPS for the Sun. The Personal Mainframe also comes with twice the memory and a larger monitor.

For both Gulf Interstate and TCI, product delivery ranked second on the list of reasons for choosing Sparc clones. "We had problems with Sun delivery. They promise delivery 30 days after receipt of the order, but it takes longer than that. With Opus, we had the machines in two weeks," Stiner says.

Gauthier says a 100% compatible clone frees him from total reliance on a single vendor. "There was a period when Sun was very slow to deliver the IPC. I became nervous. I don't want to put all my eggs in one basket."

Test results pending

Users also report that clone performance meets or beats that of the comparable Sun, although no one has conducted formal benchmarks. "It looks and feels and acts just like a Sun, but we haven't benchmarked it yet," says Ed Taylor, president of Pencom Software in Austin.

An independent benchmarking company, Workstation Laboratories in Irving, Texas, just received its first clone and expects to release its first benchmark results later this summer.

For truly high performance, users are turning to the Solbourne system, which positions itself as a high-performance Sparc machine rather than a Sun clone. Solbourne uses symmetric multiprocessing architecture. Sun relies on a uniprocessor.

"Solbourne is trying to be the Compaq of the Sparc world. They've added value with their multiprocessing. They're eating Sun's lunch in the high-performance server market," says John Dunkle, vice president of Workgroup Technologies, Inc. in Hampton, N.H.

"We set out to purchase Suns, but then we looked at Solbourne and felt that it gave a lot more bang for the buck," says Roy Tobin, a systems analyst at Brooktree Corp. in San Diego. In Brooktree's benchmark tests, the Solbourne 5 beat a Sun Sparc 1 with a graphics accelerator. Against Sun's Sparc 2, however, the Solbourne had no graphics speed advantage, Tobin reports.

> "WE SET out to purchase Suns, but then we looked at Solbourne and felt that it gave a lot more bang for the buck."
>
> ROY TOBIN
> BROOKTREE

While users are pleased that they have options, they also say the clones have a few problems.

The biggest frustration users have with the Sparc clones is that they are hard to find. Despite the number of companies offering clones, most such firms are shipping only small quantities. Also, they are small companies that possess limited marketing punch. Users frequently find them by stumbling into one at a trade show or hearing about them through the grapevine.

"We never looked at any other clones. We thought Solbourne was the only one," says Larry Ansley, MIS technical specialist at NCR/Terra Data in San Diego.

Additionally, some users are concerned about how fast the clone makers will be able to get the latest Sun upgrades.

"The only problem I see with the Sparc clones is that Sun isn't compelled to keep the clone makers up to date on SunOS. It seems they keep the clone makers about one version behind," Gauthier says. Gulf Interstate runs the most recent release of SunOS on its clones now, but "I'm concerned about the next release," he allows.

Dunkle confirms that Sun is slow to deliver upgrades to its clone licensees. "It's their way of giving themselves a built-in strategic advantage," he notes. Users get the upgrade, but there can be a lag of a few months.

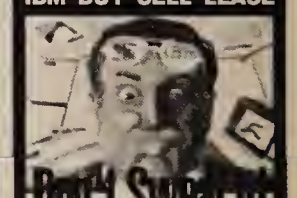
Radding is a free-lance writer in Newton, Mass.

Buy/Sell/Lease

IBM RISC/6000™
New & Used
CALL THE LEADER
CALL TODAY!
(714) 735-2102
Dave Roekle
(702) 782-5208
Mike Nelson
COMPUTER MARKETPLACE
205 East 5th Street
Corona, CA 91719
Fax (714) 735-5717
• MACHINES
• FEATURES
• UPGRADES
• MEMORY
• DISK DRIVES
• PARTS
• ADD-ON'S
• MAINTENANCE
PARTS
7010-7012
7013
7015-7016
RISC/6000 is a Registered Trademark of International Business Machines, Inc.

IBM SPECIALISTS
AS/400 · SYS/3X
BUY · SELL · TRADE · LEASE
UPGRADES · FEATURES · PERIPHERALS
NEW AND USED
IBM MAINTENANCE GUARANTEED
ON STAFF TECHNICIANS
IBM COMPATIBLES:
PERLE CONTROLLERS · AI MEMORY
LYNK DISPLAY STATIONS · BEST UPS
CMA COMPUTER MARKETING of America, Inc.
800-251-2670
610 BRYAN ST. • P.O. BOX 71 • OLD HICKORY, TN 37138
IN TN (615) 847-4031 • FAX (615) 847-5739

Specializing in:
EDX to AIX MIGRATION
Series/1 to RS/6000 Migration Services
RT
RS/6000
SERIES/1
SYSTEM 36/38
AS/400
9370
4300
Buy - Sell - Lease
CALL 612-942-9830
DATATREND Inc.
10250 Valley View Road, Suite 149
Eden Prairie, Minnesota 55344
CDIA Member Computer Dealers & Lessors Association

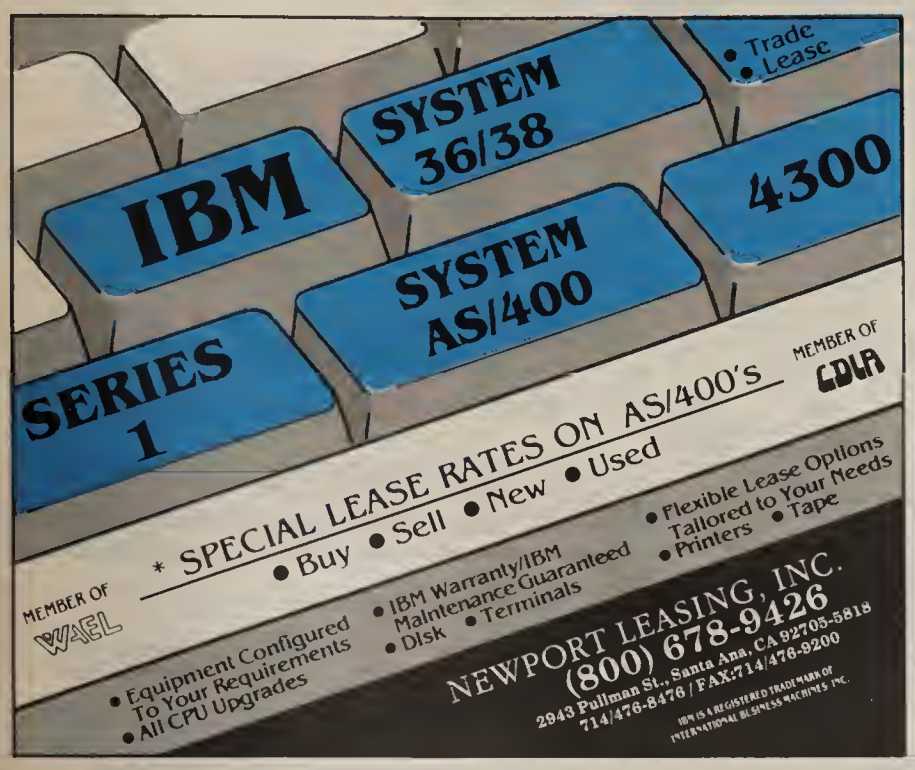
IBM BUY SELL LEASE

Don't Sweat It!
That's because Dana offers the full range of new and used IBM midrange systems and peripherals, as well as third-party peripherals.
So call Dana today, and relax while we save you time and money— no sweat!
Dana
Serving midrange systems users worldwide since 1979
California 800.433.4148 213.830.9009
Connecticut 800.634.5516 203.359.8040
Ohio 800.255.7560 614.899.0204
Arizona 800.433.4148 602.266.0645

RISC Workstation
1.2 GB SCSI Disk Drive
W/Enclosure and Cable
UNIDATA WORKSTATION SOLUTIONS WORLDWIDE
ONLY $2,750.00
(916) 362-1239 • FAX (916) 362-2419
PLUG-N-PLAY!

CALL TODAY FOR A QUOTE 1-800-ICE-BUYS
BUY ■ SELL ■ LEASE ■ NEW ■ USED
PERIPHERALS ■ SYSTEMS ■ UPGRADES
6000/8000 Series Mem ..... all sizes
6410 Sys...W/Lic 8650 Sys...W/Lic
Micro VAX II / III ..... Built to spec
Apollo DN2500 Sys New Loaded 6K
Data General Avion Sys NEW 25% off
VT220 used $225 Maxtor 2190 Refurb $850
VT320 new $420 TK50-AA $850
VT420 new $495 DSRVB-AA $1,600
digital
Data General
sun
apollo
IBM
TEL.: (617) 585-8688. FAX: (617) 585-9177
163 MAIN ST.. KINGSTON, MA 02364
INTERNATIONAL COMPUTER EXCHANGE, LTD.

LARGE SCREEN
video projectors for
SUN IBM DEC HP
workstations
used $4K - $6K
new $18K - $23K
Rentals
Training / Marketing
Engineering Applications
A.V. Presentations
800-648-7176
Northboro, MA

Buy/Sell/Lease



DEMPSEY.
WHERE IBM QUALITY IS SECOND NATURE.

• SERIES/1
• 9370
• 4381
• AS/400
• SYSTEM 36/38
• POINT OF SALE

BUY–LEASE–SELL
• Processors
• Peripherals
• Upgrades

For pretested equipment, flexible financing, configuration planning, technical support and overnight shipping call
(800) 888-2000.

Dempsey BUSINESS SYSTEMS
Where IBM Quality Is Second Nature.
18377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648 • (714) 847-8486 • FAX: (714) 847-3149
CDLA Computer Dealers & Lessors Association

JULY
Editorial Topics and Closing Dates

Marketplace Section:
Service and Support for Mail Order PCs
Close: *July 16*
22

Marketplace Section:
What Outside Auditors Look For
Close: *July 23*
29

HP HP HP HP
NEW and USED
1000 • 3000 • 9000
Including Spectrum
BUY • SELL • TRADE • RENT • LEASE
Processors • Peripherals • Systems
All in Stock - Immediate Delivery
All warranted to qualify for manufacturer's maintenance
ConAm Corporation
It's Performance That Counts!
800/926-6264 213/419-2200
FAX 213/419-2275

VAX RENTALS
VAX 4000 SERIES
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals
• Fast Turnaround • Dependable Products
• Upgrade/Add-On Flexibility
• 6 Months • 12 Months • 24 Months
BROOKVALE ASSOCIATES
CDLA Member Computer Dealers & Lessors Associates
dda Digital Dealers Associates
EAST COAST (516) 273-7777
WEST COAST (206) 392-9878

AS/400
9370
CPU'S ■ FEATURES
UPGRADES ■ PARTS
BUY ■ SELL ■ LEASE
1-800-553-0592
in MN 612-931-9000 FAX 612-931-0930
WORLD DATA PRODUCTS
12800 Whitewater Drive, Ste. 130, Minnetonka, MN 55343
CDLA Computer Dealers & Lessors Association

The BoCoEx index on used computers

Closing prices report for the week ending July 5, 1991

	Closing price	Ask	Bid
IBM PC Model 176	$200	$450	$200
XT Model 089	$400	$500	$350
AT Model 099	$600	$675	$500
AT Model 239	$625	$725	$600
AT Model 339	$725	$1,000	$700
PS/2 Model 30-286	$1,150	$1,300	$1,000
PS/2 Model 60	$1,300	$1,700	$1,300
PS/2 Model 70P	$3,400	$3,600	$3,200
Compaq Portable II	$700	$1,050	$700
Portable 286	$1,100	$1,350	$1,000
SLT 286	$1,700	$1,900	$1,550
Portable 386	$1,900	$2,100	$1,500
LTE 286	$1,700	$1,900	$1,600
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
SE	$1,100	$1,250	$1,050
IIX	$3,550	$3,600	$3,500
IICX	$3,300	$3,600	$3,200
IIFX	$5,400	$5,800	$5,200

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

New/Reconditioned
digital Equipment
Whatever your requirements are for Digital Equipment, call CSI *first!* Buying, selling, trading, leasing, consignments - we do it all!
CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is ***eligible for DEC maintenance.***
Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.
CSI Compurex Systems, Inc.
83 Eastman St.
Easton, MA 02334
Call Toll-Free
1-800-426-5499
In Mass. (508) 230-3700
FAX (508) 238-8250

SPECTRA EQUIPMENT CORPORATION
(714) 970-7000 (800) 745-1233 (714) 970-7095 FAX
BUY SELL RENT LEASE
IBM digital XEROX
ANAHEIM CORPORATE CENTER
5101 E. La Palma Ave.
Suite 206
Anaheim
California 92807
ES 9000, 9370, 4381, AS400, S/36, S/38, Point of Sale, CAD/CAM, Series/1, Banking
MicroVax, VAX 6000, VAX 8000
PROCESSORS PERIPHERALS UPGRADES
3700, 4045, 4050, 4090, 8790, 9790
Integrity . . . the Spectra difference!
A full line IBM, Digital and Xerox dealer

629,000 IS/DP Professionals see the
CLASSIFIED MARKETPLACE each week.
Call for advertising information:
(800) 343-6474
(In MA., 508-879-0700)

Data General
- Large inventory of new & used DG equipment available
- Complete systems & spare parts for Nova & MV systems
- Also new Plug-Compatible Disk, Tape & Printers
- World-wide Service

Buy-Sell-Lease-Rent
International Computing Systems
800-522-ICSC
Fax: 612-935-2580

9370's
Most Machines, Upgrades, Peripherals & Features in Stock
Now Supplying ES/9000-9221's
Call us for a quote
708-215-9370 Fax: 708-215-9992
Executive Infosource
1548 Barclay Blvd.
Buffalo Grove, IL 60089
9221's

CLASSIFIED

Buy/Sell/Lease

IBM AS/400
Automated Backup
SIMPLE • INTEGRATED • UNATTENDED

Integrated AS/400 media management backup and restore with Magna's OZONE:
Menu-driven software in simple English (no extensive CL knowledge needed)
Unattended, automatic backup
On-line data-base tracks what, when and where to restore
Full media management and tracking

CALL FOR FREE 14-DAY DEMO
FOR QUALIFIED CUSTOMERS
Magna's OZONE Backup Software from:

wpb
Authorized Magna Dealer 1-800-223-9264

WE BUY

- Data General
- Sun
- Data Products
- CDC
- PC Equipment

Associates inc
(617) 982-9664
FAX
(617) 871-4456

IBM
BUY • SELL • LEASE
4381 • 3725/3745 • 3380 • 3480
• All peripherals • Feature Work
• IBM MAQ • Upgrades
Salem Computer Group
(800) 727-5999 CDLA Member Computer Dealers & Lessors Association Fax (919) 777-3400

HONEYWELL
LEVEL 6 DPS 6
BCS
Boudreau Computer Services
• Complete Minicomputer Line -- New & Used
• Upgrades and Features
• Depot Repair Capability
• Immediate Delivery
Low Prices
(508) 393-6839
FAX 508-393-3781
BULL

Software

KeyEntry III
PC-BASED DATA INPUT SOFTWARE

Replace dedicated Data Entry Systems Front-End Mainframe Applications

- LAN or stand-alone environments
- Two-pass verification
- Batch balancing and check digits
- Operator statistics reporting
- Embedded-numeric key-pad emulation
- Extensive field edits and table lookups
- Screen Painter and MenuManager included
- Batch Control System and Reformat utility
- User-definable help screens and windows
- OS/2 version
- Outstanding customer support
- Thousands of users worldwide
- French, Spanish, and German versions
- Consulting, conversion and integration services

800-533-6879
FREE DEMO DISK AVAILABLE!
SCS Southern Computer Systems, Inc.
Phone (205) 251-2985 ■ FAX (205) 322-4851
In Europe: SCS Europe, Ltd. 0753-36550 ■ FAX 0753-36765

Conversions

Data Conversion and Tape Duplication Specialists

Disk Interchange Service Company specializes in transferring files between incompatible computers, including:

- DEC VAX and PDP-11
- TK-50, Tape, Disk Packs
- Word-11, WordPerfect, Mass-11, WPS + (via DX), others.

Tape Duplication services for:
- 9-Track tape (1600 & 6250BPI)
- DEC TK-50 and TK-70
- Cartridge tape

Call for Details
DISK INTERCHANGE SERVICE COMPANY
2 Park Drive • Westford, MA 01886 • (508) 692-0050

Peripherals/Supplies

BEST PRICE
CALL NOW

9 TRACK

- PC/Mainframe Data Interchange
- 1600/3200/6250 BPI
- 486/386/AT/XT/PC/PS-2
- DOS, UNIX, XENIX Support

DIGI-DATA
800/782-6395 FAX 301/498-0771

Bids/Proposals/Real Estate

Request For Proposals
Computer Management Information System - RFP NO. 82-2

The County Commissioners of Charles County are requesting technical/cost proposals for the provision of fully operational Management Information System software. Proposal forms, Scope of Services, and related documents may be obtained at the Purchasing Office, Room B 118, Charles County Government Center, La Plata, MD 20646, between 8 am and 4:30 pm, Mon.-Fri. Proposals will be accepted until 4:30 pm August 9, 1991. A pre-proposal conference will be held July 29, 1991, 9 am at the Government Center. Inquiries concerning proposal documents should be directed to the Purchasing Office; telephone (301) 645-0658 or 870-2788. Inquiries of a technical nature should be directed to Hans Lobisch, Data Processing, at 645-0723. The Commissioners reserve the right to reject any or all proposals and to waive any informalities in the proposals received when such waiver is in the best interest of Charles County.

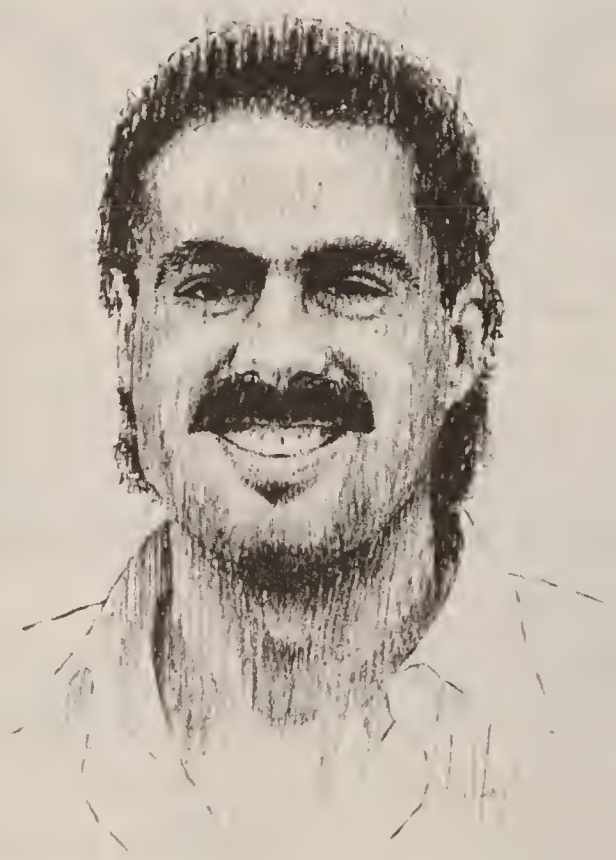
MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg, Suite 508, Jackson, MS 39201 for the following:

General RFP 2032, due Thur, 7/25/91 at 3:30 p.m. for the upgrade of the existing Periphonics telephone registration system at the University of MS.

Detailed specs may be obtained from the CDPA office. CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604



"A consistent volume of high-quality leads is why we advertise only in Computerworld's Marketplace Pages."

- Mark Ostroff
President & Partner
Compurex Systems, Inc.

A distributor speciolizing in new ond recondi-tianed DEC equipment, Compurex Systems offers end users o complete product line of systems, disk drives, ond peripherols. Since everyone with something to sell or laoking to buy is a pa-tentiol customer, President Mork "Racky" Os-troff ond Portner Christapher Pernack need ta reoch a brood bose of praspects in virtually ev-ery industry. Ta goin the greatest exposure ev-ery week, they odvertise in *Computerwarld's Marketploce Poges.*

"While we're located just south af Boston in Eas-ton, MA, we service end users both notianolly ond internotianolly. Sa getting the Campurex name out requires the most broad-bosed classi-fied odvertising vehicle ovailable. ...Computer-world, with its lorge subscriber bose and distri-butian to o wide voriety af professianals, lets us braaden our harizons throughout the world.

"Specifically, we need ta tell every patentiol customer, porticulorly the Fortune 500, obout oll the options open to them. Abaut our pragrams for buying, selling, troding, leosing, and cosign-ments. About substontiol cost savings ovoiloble with fully worronteed reconditioned DEC equip-ment. About our competitive pricing structure. And obout haw we stond behind everything we sell to ensure customer satisfoctian. Loaking ot the steady streom of quolity colls we receive ev-ery week, we know our odvertisements in *Computerworld's Morketploce Pages* reoch oll the right people.

"With compony soles hoving increased 35 per-cent annuolly over the past five yeors, it's criticol thot we build an thot mamentum by cantinuing to generote seriaus leods fram our very best pros-pects. A consistent volume of high-quolity leods is why we odvertise only in *Computerworld's Mor-ketploce Poges.* And, bosed on results, aur classi-fied odvertising in *Computerworld's Morketplace Poges* more thon poys for itself. So that's where our classified messoge will stay ta keep the colls coming in - week after week."

Computerworld's Morketplace Poges. It's where computer buyers meet computer sellers - every week. Sellers ond buyers such as Compurex Sys-tems who advertise in *Computerworld's Morket-ploce Pages* to get results. Ta put your classified soles messoge into the honds of Americo's most influentiol buyers, coll John Carrigon, Vice Presi-dent/Clossified Advertising, ot 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD
MARKETPLACE PAGES
Where computer buyers meet computer sellers. Every week.

1 800 343-6474
IN MA 508 879-0700

BEST READ IN STUDY AFTER STUDY BY INFORMATION SYSTEMS DECISION-MAKERS

Time/Services

ONE SOURCE
TOTAL SOLUTIONS

Litton Computer Services is the single source for your outsourcing requirements. From data processing to coast-to-coast networking to software development and integration, we're just what you're looking for.

- Multiple Data Centers
- Large-scale Information Systems
- Nationwide Network
- Remote Facilities Management
- Migration Specialists
- Operating System Conversions
- Integrated Financial Systems
- Major Third-party Software Packages

Call toll-free, 1-800-752-6527

Litton
Computer Services

The Genix Group

At The Genix Group, we provide mainframe computer outsourcing solutions to major international clients. With computer facilities that are among the finest in the country, your data is secure, yet readily available to you. Our high-quality, cost-effective services include:

- Computer operations 7 days a week, 24 hours a day
- Network Management
- Electronic Printing

State-of-the-art IBM compatibility:

MVS-ESA * VM/XA * TSO/E * ROSCOE * CICS * IMS * IDMS/R * DB2 * QMF * PROFS

Programmer productivity aids:

FILE-AID * CICS PLAYBACK * dBUG-AID * ABEND-AID * CICS ABEND-AID

(Preceding products are registered trademarks of Compuware Corporation.)

For more information, please call:

1-800-521-0444

The Genix Group
5225 Auto Club Drive
Dearborn, Michigan 48126

STAT-TAB

OUTSOURCING TIMESHARING
FEATURING...

- IBM mainframes & peripherals
- UPS: battery, dual-turbine generator back-up
- Automated print distribution
- 24-hour, 7-day processing
- Full technical support
- Network specialists
- Migration support
- Laser printing: sheet & continuous form

OPERATING ENVIRONMENTS

MVS/XA CICS VM/XA
TSO/E DB2 CMS
ISPF/PDF IMS/DB/OC
VM-MAGIC VPS
FOCUS DOS/VSE

PRODUCTIVITY/ DEVELOPMENT AIDS

SAS EASYTRIEVE PLUS
FILEAID ABENDAID
SPREADSHEET GOOM
IAM COMPAREX
XCOM 6.2 E-MAIL
ACCTG. PKGS. XICS

COMMUNICATIONS/ NETWORKING

IBM INFORMATION NETWORK
TOKEN RING NJE
T1 SUPPORT TYMNET
PROTOCOL CONVERSIONS
PC-HOST SUPPORT
...and much, much more

CALL JOE BALSAMO
(708) 449-DATA

STAT-TAB
a division of CREATIVE AUTOMATION COMPANY
220 Fencl Lane
Hillside, IL 60162
Serving the Nation Since 1936

REMOTE COMPUTING • OUTSOURCING

- MVS/ESA
- MVS/XA
- DB2
- CICS
- TSO
- IMS/DBDC
- VM/370
- CMS
- DOS/VSE

OVER 150 SOFTWARE PRODUCTS

- DEVELOPMENT
- PRODUCTIVITY
- DEBUGGING
- PERFORMANCE

- TELENET
- SEARSNET
- TYMNET
- IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE
MIGRATION MANAGEMENT

GIS INFORMATION SYSTEMS, INC
815 Commerce Drive, Oak Brook, IL 60521

708-574-3636
New England 617-595-8000

OUTSOURCING AND REMOTE COMPUTING

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Simplified Pricing and Invoicing
- AS/400
- Full Supporting Services
  - Media Conversion
  - Laser & Impact Print Facility
  - Application Programming
- Technical Support
- 24 Hours a Day – 7 Days a Week

May & Speh, inc.
1501 Opus Place, Downers Grove, IL 60515-5713
1(800) 729-1501
For More Information Contact: Tony Ranieri

Financial Technologies

Innovative, Responsive, Quality

a few words that describe the most complete computer processor

offering.....

IBM 3090, MVS/XA, MSA, DB2, VM/HPO, TSO, CICS/VSAM and a multitude of third party software

the complete source for ... outsourcing ...

1-800-443-8797

14300 Sullyfield Circle
Chantilly, Virginia 22021

COST-EFFECTIVE COMPUTING SERVICES for TODAY and.... TOMORROW

COMDISCO COMPUTING SERVICES CORP.

Provides you with:

REMOTE COMPUTING
COMPUTER OUTSOURCING
FACILITY MANAGEMENT

Featuring:

- IBM® CPUs and Peripherals
- Systems Software: MVS/ESA, MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, DOS/VSE, HPO, CMS
- Application Software: Database Management, Application Development, 4/GLs, Graphics, Statistical Analysis
- Multiple Communications Methods
- Technical/Operations/ Production Support
- Automated Tape Handling
- ULTRA-Secure Data Center
- Advanced Laser Printing
- Disaster Recovery Services

Call: Robert Marino
201-896-3011

COMDISCO

COMDISCO COMPUTING SERVICES CORP.
430 Gotham Parkway, Carlstadt, NJ 07072

It's the *Classified Marketplace*

Reach Computer Professionals Where They Shop For:

- ☐ Buy/Sell/Lease
- ☐ Conversions
- ☐ PC Rentals
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/ Real Estate
- ☐ Business Opportunity

(800) 343-6474
(in MA., 508/879-0700)

REMOTE COMPUTING

- We locate COMPUTER TIMESHARING, including OUTSOURCING on ALL mainframes.
- Since 1968 we have found your LOWEST prices from over 800 nationwide data centers.
- NEVER a charge to the Buyer, because our fee is paid by the Seller.

CALL DON SEIDEN AT

COMPUTER RESERVES, INC.

(201) 882-9700

---

icotech

MVS/ESA • DB2 • LIBRARIAN
CICS • TSO • SAS • ADABAS

Outsourcing & Computing Services

- 24 Hours/7 Days
- Superior Technical Support
- Worldwide Access
- Uninterrupted Service
- On-line/Batch/RJE
- MICR, Laser & Impact Printing
- Media Conversion

908 • 685 • 3400

Committed to Excellence in Quality Service and Customer Satisfaction

---

COMPUTERWORLD
CLASSIFIED MARKETPLACE

Examines the issues while computer professionals examine your message. Call for all the details.

(800) 343-6474
(In MA., 508/879-0700)

SALES OFFICES
Publisher/Gary J. Beach

BOSTON: Regional Vice-President - North/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Linda Clinton, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(S0B) B79-0700**

CHICAGO: Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivant, Karol Lange, **COMPUTERWORLD**, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (70B) B27-4433

NEW YORK: Regional Vice-President - East/Bernie Hockswender, Senior District Manager/Fred LoSapio, District Manager/Paula D'Amico, Sales Assistants/Susan Kusnic, Patricia DeBlase, **COMPUTERWORLD**, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

LOS ANGELES: Western Regional Director/Betsy Burroughs, Southwestern Regional Manager/Fran Cowen. Sales Assistant/Bev Raus, **COMPUTERWORLD**, 1800B Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Regional Vice-President - West/Michela O'Connor Abrams, Senior District Manager/Emie Chamberlain, District Managers/Michele Gerus, Kaye Sharbrough, Western Regional Director/Betsy Burroughs, District Manager/John J. Flood, Sales Assistants/Nurit Zekman, Chris Kobayashi, Carol Lacasse, Lisa Cremarosa **COMPUTERWORLD**, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Regional Vice-President - East/Bernie Hockswender, Sales Assistant/Debra Brown, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-075B

DALLAS: Regional Vice-President - Midwest/Kevin McPherson, Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: Regional Vice-President - East/Bernie Hockswender, District Manager/Paula D'Amico, **COMPUTERWORLD**, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

CLASSIFIED ADVERTISING SALES:
Vice President/Classified Advertising/John Comgan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(S0B) B79-0700**

PRODUCT CLASSIFIED ADVERTISING:
East: Account Manager/Paul Bonamigo, 375 Cochituate Rd., Framingham, MA 01701-9171 (B00) 343-6474, In MA **(S0B) B79-0700**

West: Account Executive/Bill Creonte, 375 Cochituate Rd., Framingham, MA 01701-9171 (B00) 343-6474, In MA **(S0B) B79-0700**

RECRUITMENT ADVERTISING SALES OFFICES:
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (B00) 343-6474, In MA (50B) B79-0700, Account Executive/Karen Lesko, (B00) 343-6474, In MA **(S0B) B79-0700**

Mid-Atlantic: Regional Manager/Valerie Galbo, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350, Account Executive/Caryn Dlott, (B00) 343-6474

South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (B00) 343-6474

Midwest: Regional Manager/Pat Powers, O'Hare Corp. Twr 1, 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 60018 (70B) 827-4433, Account Executive/Ellen Casey (800) 343-6474

West: Regional Manager/Barbara Murphy, 1B00B Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Account Executive/Christopher Glenn (B00) 343-6474

DIRECT RESPONSE CARDS:
East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 5B7-0090

West: Account Executive/Jill Halbert, 1B008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

IDG INTERNATIONAL MARKETING SERVICES:
President/Richard Soule, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(S0B) B79-0700**

West Coast Marketing Manager/Leslie Bamer, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING, INC.
An IDG Company: The World's Leader in Information Services on Information Technology.

Gary J. Beach
CEO & Publisher
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 50B-B79-0700, Telex: 95-1153, FAX: 50B-B75-4394

Matthaw Smith
Senior Vice-President
Chief Financial Officer

FINANCE Controllar, Mark Sullivan.
PUBLISHER'S OFFICE Executive Assistant to the CEO/Publisher, Karan Elliott
SALES - DISPLAY Advertising Director, Carolyn Novack. Display Advertising Production Manager, Maureen Hanley.
SALES - CLASSIFIED Vice Prasident Classified Advertising, John Corrigan.
Classified Marketing Director, Derek E. Hulitzky. Classified Operations Director, Cynthia Delany.
Classified Sales Supervisor, Jay Novack
MARKETING Manager, Marketing Communications, Mary Doyle. Account Manager, Marketing Communications, Elizabeth Phillips. Manager, Trade Show & Conventions, Audrey Shohan. Market Development Manager, Chuck Boyd.
Administrative Assistant, Patty Faherty
CIRCULATION Director of Circulation Management, Maureen Burke. Director of Circulation Promotion, Carol Spach.
PRODUCTION Vice President/Manufacturing, Leigh Hometh. Director of Publishing Technology, Carol Polack.
Production Manager, Beverly Wolff.
SYSTEMS Director of Information Systems, Linda Nelson.
Administrative Sales Assistant,Nancy Gibbs.

GLOBAL LEADERSHIP NETWORK
FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, CW Communicaciones 5/A, Av. Belgrano 406 Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583 Telex: (390) 22644 (BAZAN AR).

ASIA: S.W. Chan, Asia Computerworld Communicetions Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. FAX: (011) 852 5 86 10953.

AUSTRALIA: Alan Power, IDG Communications Pty. Ltd., 37-43 Alexender Street, Crows Nest, N5W 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR). FAX. (011) 61 2 439 5512.

AUSTRIA: Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Zieglergasse 6, A-1070 Wien, Austna Phone: (011) 43 523 16 31 0. Telex: (847) 115542 (SCH/A) FAX: (011) 43 523 05 08 33.

BRAZIL: Ney Kruel, Computerworld do Brazil Ltda, Praca Floriano, 19/26 Andar, 2031 Rio de Jeniero, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30830 BR. Sao Paulo: Computerworld do Brazil Ltda., Rua Joaquim Floriano, 488/3 andar-CEP 04534, Sao Paulo, Brazil, Tel: (011) 55 11 852 8536. Telex: (391) 1132017 (WORO BR).

COLOMBIA: Heli Abel Torrado, La Nueva Ley, Computerworld-Columbia, Transv. 23 No. 58-28, Apartodo Aereo 54018, Bogota, O.E. Columbia. Tel: (011) 57 248 9010.

DENMARK: Preben Engell, IDG Danmark A/S, Krujmtappan 4 DK-2500 Valby Denmark. Tel: (011) 45 36 442800. Telex: (855) 31566. FAX: (011) 45 36 442033.

FRANCE: Francois Chaussonniere, IDG Communications S.A., Immeuble La Fayette, 2, Place des Voques, Cedex 65, 92051 Pans la Oefense, France. Tel: (011) 33 1 4904 7900. Telex (842) 613234F. FAX: (011) 33 1 4904 7800.

HUNGARY: Dezso Futasz, Computerworld Informatike Co., Kft. Pf. 386, 1536 Budapest, Hungary, Phone: (011) 3611 228 458. Telex: (861) 225307 (K5HP H). FAX: (011) 3611 423 965.

INDIA: S.K. Bhayena, Medie Transasia India Ltd., 102 Anand Lok, New Delhi 110049, India. Tel: (011) 91 11 644 0110. FAX: (011) 91 11 643 2950.

ITALY: Umberto Costamagna, Computer Publishing Group CPG, Vie Vide 7, 20127 Milano, Italy. Phone: (011) 39 2 2613432. Telex: (843) 335318. FAX: (011) 39 2 284 0737

JAPAN: Jim Povec, IDG Communications/Jepan, Kiolcho T8R Bldg., 5-7 Kojimachi, Chiyodaku Tokyo 102, Japan. Tel: (011) 81 3 222 6411. Telex (781) 252 4217. FAX: (011) 81 3 222 6566.

MEXICO: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 O.F. Colonia Roma, 06700 Mexico. Tel: (011) 52 5 514 4218 or 6309. Telex: (383) 177 1300 (ACHAME). FAX: (011) 525 511 4860.

THE NETHERLANDS: Ruud Bakker, IDG Communications B.V., de Paulus Potterstraat 18, 1071 DA Amsterdam, The Netherlends. Tel. (011) 31 20 664 6426/664 5818. Telex: (844) 18242 (CWCOM NL). FAX: (011) 3120 796 006.

NEW ZEALAND: Martin Taylor, IDG Communications Ltd., 2nd Floor, 15 Augustus Terrace, Pamell, Auckland 1, New Zeeland. Phone: (011) 64 9 779 902. Fax: (011) 64 9 774 604.

NORWAY: Morten Hansen, CW Norge A/S, Hovinveien 43, 0576, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N). FAX: (011) 47 268 0152.

PEOPLE'S REPUBLIC OF CHINA: Shen Yao, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Tel: (011) 861 81 0044. Telex: (716) 222214 (CCW CN).

SINGAPORE: Asia Computerworld Communications, 04-07 Parkway Builders Centre, No.1 Merine Parade Central, Singapore 1544. Republic of China. Phone: (011) 65 345 8383. Telex: (786) RS 37003 (Comwor). FAX: (011) 65 345 7097.

SOUTH KOREA: Young-Sil Gimm, Hi Tech Information, Inc. 5th floor, Pungchun Building, 45-1 Wohyo-Ro 1 Ga, Youngsan-Gu, Seoul 140-111, Korea Tel: (011) 82 2 719 8031. FAX: (011) 82 2 713 5971.

SPAIN: Paco Zabala, CW Communicetions, S.A., Refael Calvo, 18, 48, 28010 Madnd, Spein. Phone: (011) 34 1 419 4014 Telex: (831) 45522 (CW E). FAX: (011) 34 1 419 6104.

SWEDEN: Bengt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, 5-115 41 Stockholm, Sweden. Tel: (011) 46 8667 9180. Telex: (854) 14904 9 (NOVACW). FAX: (011) 46 8667 8780.

SWITZERLAND: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zunch, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH). FAX: (011) 41 1 55 1135.

TAIWAN: David Chu, IDG Communications/Taiwan, 4F-2, No. 137, Fu Hsin South Road, Sec. 1 Taipei, Taiwan, Phone: (011) 886 2 776 4553. Telex: (785) 14142 (ACE-GROUP). FAX: (011) 886 2 721 6444.

LONDON: Richard Ward, CW Communications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (011) 44 71 405 2347. Telex: (851) 262346. FAX: (011) 44 71 405 2347.

UNITED KINGDOM: Colin Smith, Oliver Smith & Partners, 18 Abbeville Mews, 88 Clapham Park Road, London SW4 78X, United Kingdom. Phone: (011) 44 1 978 1440. FAX: (011) 44 1 978 1550.

VENEZUELA: Kalmen von Vajna Nagy, IDG Comunicaciones C.A., Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela Phone: (011) 58 2 72 76 30. FAX: (011) 58 2 724970.

WEST GERMANY: Eckherd Utpedel, IDG Communications Verlag AG, Rheinstrasse 26/28, Postfach 40 04 29, 8000 Munich 40, West Germany. Phone: (011) 49 89 360860. Telex: (851) 5215350. (COMW 0). FAX. (011) 49 89 3 60 86257.

INTERNATIONAL DATA GROUP, INC.

Patrick J. McGovern	Walter Boyd	William P. Murphy	Fritz Landmann
Boerd Chelrman	President	Vice President/Finance	Sr. Vice President

Computerworld is a publication of International Oata Group, the world's largest publisher of computer-related information. Intemational Oata Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more International Oata Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Asian Computerworld; AUSTRALIA'S Computerworld Australia, PC World, Macworld; AUSTRIA'S Computerwelt Desterreich; BRAZIL'S DateNews, PC Mundo; CANADA'S ComputerData; CHILE'S Informatica, Computacion Personal; COLUMBIA'S Computerworld Columbia; DENMARK'S CAD/CAM WORLD, Computerworld Danmark, PC World, Mecworld, Unix World; FINLAND'S Mikro PC, Tietovilkko; FRANCE'S Le Monde Informatique, Distributique, InfoPC, Telecoms International; HUNGARY'S Computerworld SZT, Mikrovilag; INDIA'S Computers & Communications; ISRAEL'S People & Computers; ITALY'S Computerworld Italia, PC World Italia; JAPAN'S Computerworld Japan, Infoworld, Publish; KOREA'S Hi-Tech Information/Computerworld; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLANO'S Computerworld Netherlends, PC World, Amiga World; NEW ZEALAND'S Computerworld New Zealand, PC World New Zealand; NIGERIA'S PC World Africa; NORWAY'S Computerworld Norge, PC World Norge CAD/CAM, Macworld Norge; PEOPLE'S REPUBLIC OF CHINA Chine Computerworld, China Computerworld Monthly; POLAND'S Computers; SPAIN'S CIM World, Communicaciones World, Computerworld Espana, PC World, Amige World; SWEOEN'S Computer Sweden, PC/Nyhetherna, Mikrodetom, PC World, Mecworld; SWITZERLAND'S Computerworld Schweiz; TAIWAN'S Computerworld Taiwan, PC World; UNITED KINGDOM'S Greduate Computerworld, PC Business World, ICL Todey, Lotus UK, Macworld U.K.; UNITED STATES' Amiga World, CID, Computerworld, Digital News, Federel Computer Week, GamePro, InCider, InfoWorld, International Custom Publishing, Macworld, Network World, PC Games, PC World, Portable Computing, PC Resource, Publish!, Run, Sun Tech Journal; U.S.S.R.'S PC World U.S.S.R., Manager, PC Express, Network; VENEZUELA'S Computerworld Venezuela, Micro Computerworld, WEST GERMANY'S Computerwoche, Informetion Menegement, PC Woche, PC Welt, Amiga Welt, Mecwelt

ADVERTISERS INDEX

Anacomp 30
Ashton-Tate 28-29

B I Moyle Associates, Inc. 62
Banyan Systems 15

Candle Corp. 9
CCD On-Line Systems 27
CDB Software 64
Computer Engineering & Consultants, Ltd. 26
CW Circulation 24
CW Editorial Reprints 60

Data Peference 31
DCA C3
Digital Equipment Corp. 16-17, 36

Goal Systems 12

Harris Corp. 41

IBM 10, 20-21, 32-33, 46-47
Informix C4
Intel Corp. 42-43
Intersolv 13

J.D. Edwards 34

MCI Corp. 34/35
Micro Focus 35
Microcom 44
Multi-Tech Systems 39
Munich Trade Fairs International 54

Napersoft 25

Oracle Corp. 5

Ross Systems 14

SAS Institute 11
Sybase, Inc. 7
Syncsort 3
Synoptics 48-49

U.S. Sprint 52-53

Workstation Group 50

XDB Systems 37

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

Your New Address Goes Here

Name
Company
Address
City State Zip

Address shown: ☐ Home ☐ Business

Name
Title
Company
Address
City State Zip

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

1-800-669-1002
Outside U.S. call: (614) 382-3322

COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43305

INDUSTRY ALMANAC

ANALYSIS IN BRIEF

Regional telecommunications holding companies may soon be able to manufacture telecom equipment — to the benefit of several smaller vendors of communications gear.

The U.S. Senate passed a bill on June 5 proposing to release manufacturing restrictions on regional holding companies. A similar measure has been submitted to the House of Representatives; the issue is likely to be resolved during the current session of Congress.

Relief from manufacturing restrictions could come in various forms, which include allowing holding companies to own, set up joint ventures with and buy minority interests in telecommunications equipment makers. Impact on the telecommunications industry would be varied as well:

Losers. Because it is much too large to be an acquisition target, **AT&T** would be a clear loser. It is unlikely to be a research and development joint venture partner, and it is currently leading opposition to the Senate bill on Capitol Hill.

Uncertainties. Effects on **Northern Telecom, Inc.** and other foreign-based manufacturers, including **Ericsson, Inc.** and **Siemens AG**, are less clear. They would probably face increased competition in certain product areas, as would AT&T. However, the foreign telecommunications firms could theoretically form joint ventures with the newly freed regional holding companies.

Winners. Instead of devising operating plans and ramping up manufacturing facilities from scratch, regional holding companies may seek joint ventures with smaller telecommunications companies. They may also try to take over some of these firms. The most obvious potential winners are companies such as **DSC Communications Corp.**, **Octel Communications Corp.** and **Telco Systems, Inc.**, which have a high degree of customer concentration within regional holding company districts.

Another potential winner would be **Network Equipment Technologies, Inc.**, which sells a telephone network-oriented product. While less likely, the possibility still exists that the regional holding companies will use the relief bill as a means of becoming aggressive in the local-area network sector as well. — *Regional Holding Company Deregulation Movement, Montgomery Securities, July 2, 1991*

RECOMMENDATION CHANGES

UPGRADED FROM OUTPERFORM TO BUY: **Texas Instruments, Inc.** (Shearson Lehman Brothers, Inc.). Reason: Ongoing restructuring will boost bottom line; stock price is down 30% from its recent peak but can reach $50 within 12 months, so it is a good deal now.

UPGRADED FROM BUY TO STRONG BUY: **Novell, Inc.** (Alex. Brown & Sons, Inc.). Reason: Company has reported strong sales through the recession; broad array of new products scheduled for the near future; recent stock price weakness is a buying opportunity.

DOWNGRADED FROM BUY TO ATTRACTIVE: **Digital Communications Associates, Inc.** (Mabon Securities Corp.). Reason: Earnings this quarter will be lower than anticipated, keeping a downward pressure on the stock.

KIM S. NASH

STOCK TRADING INDEX

THIS WEEK'S HIGHLIGHTS

- Borland International, Inc. stock fell after the firm's announcement of plans to buy Ashton-Tate Corp. but still gained for the week. Ashton-Tate rocketed 5⅝ points last week to close Thursday at 16, up more than 54%.
- Microsoft Corp. regained some of the ground it lost after the recent announcement of the IBM/Apple Computer, Inc. accord, advancing 2¼ points to 66¼.
- Quarterly earnings reports caused a stir in stock prices. After turning in disappointing financials, semiconductor and cellular equipment maker Motorola, Inc. sank ¾ of a point to 64⅜. IBM peripherals maker Cambex Corp. said sales and profits were up compared with the same time last year; Cambex rose 2¼ points to 14⅝.
- DSC Communications Corp., whose software contributed to the recent trouble in long-distance service, added ¾ of a notch, closing Thursday at 7. Network equipment company Synoptics Communications, Inc. shot up 5¾ points — 19.7% — to 35.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JULY 12, 1991

TOP PERCENT GAINERS

Ashton Tate	55.42
Iomega Corp.	29.21
VLSI Technology	27.59
Televideo Systems	25.20
Software Publishing Corp.	24.11

TOP PERCENT LOSERS

EMC Corp.	-27.27
Fibronix Int'l Inc.	-22.41
Information Int'l	-13.95
Businessland Inc.	-12.50
Datapoint Corp.	-10.00

TOP DOLLAR GAINERS

Matsushita Electronics	7.75
Aldus Corp.	7.00
Autodesk Inc.	6.63
Digital Equipment Corp.	6.25
Microsoft Corp.	6.25

TOP DOLLAR LOSERS

EMC Corp.	-2.63
Fibronix Int'l Inc.	-1.63
Information Int'l	-1.50
3M Corp.	-1.25
Auto Data Processing	-1.13

Exch	52-Week			July 12 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Up 2.70%**			
OTC	19.00	5.38	3 COM Corp.	7.38	0.50	7.27
NYS	69.75	52.50	American Info Techs Corp.	60.13	0.25	0.42
NYS	39.75	29.00	AT&T	38.38	-0.50	-1.29
OTC	5.00	0.88	Artel Communication Corp.	1.63	0.13	8.33
NYS	56.25	39.50	Bell Atlantic Corp.	46.50	-0.25	-0.53
NYS	56.25	46.38	Bellsouth Corp.	48.38	0.75	1.57
NYS	44.00	13.13	Cabletron Systems	42.75	3.38	8.57
OTC	25.88	8.25	Compression Labs Inc.	17.38	2.75	18.80
OTC	5.13	2.44	Data Switch Corp.	2.75	0.13	4.76
NYS	26.13	8.88	Digital Comm. Assoc.	13.75	-0.13	-0.90
OTC	25.25	12.25	Dynatech Corp.	18.50	0.00	0.00
OTC	12.38	5.50	Fibronix Int'l Inc.	5.63	-1.63	-22.41
OTC	3.88	1.75	Gandalf Technologies Inc.	2.63	-0.13	-4.55
NYS	4.13	1.63	General Datacomm Inds.	2.75	0.00	0.00
NYS	33.50	23.50	GTE Corp.	30.25	0.38	1.26
NYS	63.00	40.25	ITT Corp.	56.50	0.63	1.12
OTC	41.63	17.88	MCI Commmunications Corp.	29.75	1.25	4.39
OTC	8.13	2.75	Microcom Inc.	8.13	0.88	12.07
NYS	9.75	4.00	Network Equipment Tech.	9.38	0.75	8.70
OTC	14.63	4.00	Network General	8.75	0.63	7.69
OTC	15.50	8.13	Network Systems Corp.	12.75	1.00	8.51
NYS	38.13	22.13	Northern Telecom Ltd.	37.25	0.63	1.71
OTC	58.50	17.25	Novell Inc.	54.25	5.75	11.86
NYS	81.88	67.00	Nynex Corp.	73.13	-0.88	-1.18
NYS	47.50	36.25	Pacific Telesis Group	41.00	0.13	0.31
OTC	11.63	3.63	Penril Data Comm. Ntwks.	7.25	-0.13	-1.69
NYS	29.00	8.88	Scientific Atlanta Inc.	14.88	0.88	6.25
NYS	57.50	47.25	Southwestern Bell Corp.	54.13	1.13	2.12
NYS	40.50	20.63	United Telecom	29.50	-0.50	-1.67
NYS	40.75	32.38	US West Inc.	36.13	-0.13	-0.34
Computer Systems			**Up 4.06%**			
OTC	5.88	0.56	Alliant Computer Sys.	0.75	0.00	0.00
ASE	18.88	10.00	Amdahl Corp.	14.63	-0.13	-0.85
OTC	73.25	24.25	Apple Computer Inc.	46.75	1.13	2.47
OTC	10.50	3.50	Archive Corp.	4.25	0.25	6.25
OTC	32.75	7.50	AST Research Inc.	24.00	3.25	15.66
NYS	9.38	4.00	Bolt, Beranek & Newman	7.38	0.25	3.51
NYS	21.63	4.50	Commodore Int'l	13.25	0.88	7.07
NYS	74.25	29.88	Compaq Computer Corp.	34.38	1.13	3.38
OTC	2.13	0.13	Computer Automation Inc.	1.19	0.06	5.60
NYS	19.75	6.75	Control Data Corp.	10.13	0.13	1.25
NYS	20.88	8.38	Convex Computer	15.38	1.63	11.82
NYS	49.75	20.00	Cray Research Inc.	32.75	0.88	2.75
NYS	18.13	3.50	Data General Corp.	17.38	2.38	15.83
NYS	3.25	0.75	Datapoint Corp.	1.13	-0.13	-10.00
OTC	30.63	8.25	Dell Computer Corp.	28.75	2.63	10.05
NYS	86.88	45.50	Digital Equipment Corp.	65.88	6.25	10.48
NYS	34.25	13.75	Harris Corp.	24.75	-0.75	-2.94
NYS	55.13	24.88	Hewlett Packard Co.	53.75	3.00	5.91
NYS	139.75	96.25	IBM	99.38	0.75	0.76
OTC	13.50	7.75	Information Int'l	9.25	-1.50	-13.95
OTC	31.50	10.50	Intergraph	26.75	2.25	9.18
NYS	2.25	0.50	MAI Systems Corp.	0.50	0.00	0.00
NYS	149.75	114.00	Matsushita Electronics	127.50	7.75	6.47
OTC	19.00	9.00	Mentor Graphics Corp.	14.50	0.63	4.50
NYS	108.25	44.50	NCR Corp.	107.63	-0.63	-0.58
OTC	31.75	10.75	Pyramid Technology	14.25	1.38	10.68
OTC	33.25	8.25	Sequent Computer Sys.	10.00	1.25	14.29
NYS	47.25	18.00	Silicon Graphics	32.13	4.13	14.73
NYS	37.25	14.63	Stratus Computer Inc.	30.13	1.13	3.88
OTC	38.63	15.00	Sun Microsystems Inc.	28.13	2.25	8.70
NYS	24.13	8.88	Tandem Computers Inc.	13.25	-1.00	-7.02
NYS	39.50	23.50	Tandy Corp.	27.75	0.25	0.91
OTC	29.50	6.75	Teradata	15.00	2.00	15.38
NYS	7.75	1.38	Ultimate Corp.	3.88	-0.13	-3.13
NYS	13.75	1.75	Unisys Corp.	3.75	-0.13	-3.23
ASE	5.75	2.00	Wang Labs Inc. (b)	3.38	-0.13	-3.57
Software & DP Services			**Up 6.17%**			
OTC	63.00	17.00	Adobe Systems Inc.	48.50	4.63	10.54
OTC	13.50	5.75	Aicorp	5.75	0.00	0.00
OTC	59.88	20.25	Aldus Corp.	44.75	7.00	18.54
OTC	28.50	12.00	American Mgmt. Systems	19.25	0.50	2.67
OTC	17.25	7.50	American Software Inc.	12.88	-0.75	-5.50
NYS	4.63	1.38	Anacomp Inc.	4.13	0.38	10.00
OTC	23.50	10.00	Analysts Int'l	14.25	1.00	7.55
OTC	16.13	4.88	Ashton Tate	16.13	5.75	55.42
OTC	10.25	4.00	ASK Computer Sys.	9.00	0.88	10.77
NYS	37.00	22.63	Auto Data Processing	32.25	-1.13	-3.37
OTC	62.25	32.00	Autodesk Inc.	53.63	6.63	14.10
OTC	31.50	18.50	BGS Systems Inc.	30.25	2.25	8.04
OTC	43.88	17.75	BMC Software Inc.	40.25	3.00	8.05
OTC	20.50	8.75	Boole & Babbage Inc.	10.75	1.75	19.44
OTC	64.25	14.50	Borland Int'l	48.38	4.25	9.63
NYS	8.00	0.44	Businessland Inc.	0.88	-0.13	-12.50
OTC	20.88	5.13	Cognos Inc.	16.88	1.25	8.00
NYS	16.63	4.38	Computer Associates	9.88	-0.13	-1.25
OTC	17.75	9.50	Computer Horizons	10.00	-0.25	-2.44
NYS	73.25	36.75	Computer Sciences	68.88	-0.75	-1.08
NYS	11.25	6.63	Computer Task Group	8.00	0.13	1.59
OTC	24.25	13.00	Comshare Inc.	19.50	0.25	1.30
OTC	16.00	3.75	Corporate Software	8.50	-0.50	-5.56
NYS	49.00	27.88	General Motors E (EDS)	48.00	0.50	1.05
OTC	18.75	7.25	Goal Systems Int'l	14.00	1.00	7.69
OTC	7.00	1.88	Hogan Systems Inc.	6.00	0.44	7.86
OTC	24.63	7.75	Information Resources	23.38	0.38	1.63
OTC	17.50	2.63	Informix Corp.	5.88	0.13	2.17
OTC	7.88	1.38	Intellicorp Inc.	2.88	0.38	15.00
OTC	8.25	2.50	Interleaf Inc.	6.00	-0.13	-2.04
OTC	15.25	6.88	Intersolv	9.50	-0.50	-5.00
OTC	43.25	10.00	Knowledgeware Inc.	29.00	4.75	19.59
OTC	45.00	16.75	Legent Corp.	27.00	2.63	10.77
OTC	36.50	12.50	Lotus Development	34.50	2.25	6.98
OTC	32.00	10.75	Micrografx	12.00	0.63	5.49
OTC	78.38	33.88	Microsoft Corp.	68.00	6.25	10.12
NYS	10.50	4.00	On Line Software Int'l	9.75	-0.38	-3.70
OTC	22.88	4.88	Oracle Systems	8.88	0.75	9.23
NYS	14.25	7.00	Pansophic Systems	11.25	0.38	3.45
OTC	9.25	1.25	Phoenix Technologies	8.75	0.38	4.48
NYS	52.00	33.38	Policy Management Sys.	48.75	0.38	0.78
NYS	22.75	11.50	Reynolds & Reynolds	22.50	0.38	1.69
OTC	27.25	14.75	SEI Corp.	25.88	-0.13	-0.48
OTC	22.75	12.50	Shared Medical Systems	21.38	0.25	1.18
OTC	35.25	12.00	Software Publishing Corp.	17.38	3.38	24.11
NYS	14.63	5.50	Sterling Software	13.25	0.75	6.00
OTC	26.00	9.50	Sungard Data Sys.	16.88	0.13	0.75
OTC	55.88	17.75	Symantec Corp.	46.75	2.75	6.25
NYS	22.50	4.50	System Center Inc.	9.13	0.13	1.39
OTC	37.25	12.50	System Software Assoc.	16.00	1.75	12.28
OTC	22.75	4.75	Weitek	11.50	1.25	12.20
Semiconductors			**Up 6.98%**			
NYS	14.25	3.63	Advanced Micro Devices	13.00	1.63	14.29
NYS	12.50	5.50	Analog Devices Inc.	9.50	0.13	1.33
OTC	21.50	5.25	Chips & Technologies	8.00	0.13	1.59
OTC	59.25	28.00	Intel Corp.	46.50	3.63	8.45
NYS	13.00	5.13	LSI Logic Corp.	7.88	0.00	0.00
NYS	19.13	6.75	Micron Technology	12.38	0.75	6.45
OTC	20.88	7.25	MIPS Computer Systems	15.88	0.88	5.83
NYS	88.25	45.75	Motorola Inc.	64.50	-1.00	-1.53
NYS	8.38	3.00	National Semiconductor	6.00	0.25	4.35
NYS	47.63	22.50	Texas Instruments	36.38	1.88	5.43
OTC	12.25	3.00	VLSI Technology	9.25	2.00	27.59
ASE	14.25	3.50	Western Digital Corp.	4.13	0.38	10.00
Peripherals & Subsystems			**Up 5.77%**			
OTC	2.75	0.88	Apertus Technologies	1.63	-0.13	-7.14
OTC	22.63	7.50	Banctec Inc.	12.00	-0.13	-1.03
OTC	17.50	4.25	Cambex Corp.	14.13	2.00	16.49
ASE	11.75	4.13	Cognitronics Corp.	8.88	0.13	1.43
NYS	31.25	14.63	Conner Peripherals	18.63	1.63	9.56
ASE	22.00	7.00	Dataram Corp.	10.38	0.13	1.22
NYS	13.00	4.25	EMC Corp.	7.00	-2.63	-27.27
NYS	47.25	33.75	Eastman Kodak Co.	40.38	1.38	3.53
OTC	11.25	4.75	Emulex Corp.	8.75	1.38	18.64
OTC	29.75	14.00	Evans & Sutherland	20.00	0.50	2.56
OTC	6.50	3.88	Iomega Corp.	5.25	1.19	29.21
OTC	28.25	6.75	IPL Systems Inc.	24.00	3.00	14.29
OTC	1.38	0.13	Masstor Systems	0.75	0.06	9.01
OTC	15.88	2.50	Maxtor Corp.	2.63	-0.06	-2.34
OTC	18.00	4.38	Micropolis Corp.	6.13	0.13	2.08
NYS	97.50	73.63	3M Corp.	89.50	-1.25	-1.38
OTC	13.13	6.00	Printronix Inc.	8.50	1.50	21.43
NYS	24.75	8.50	QMS Inc.	19.13	1.25	6.99
OTC	18.25	8.25	Quantum Corp.	10.63	0.50	4.94
NYS	7.63	4.38	Recognition Equipment	6.50	0.13	1.96
OTC	11.50	4.00	Rexon Inc.	7.50	0.38	5.26
OTC	19.88	5.63	Seagate Technology	8.25	0.38	4.76
NYS	47.00	11.00	Storage Technology	42.75	4.13	10.68
OTC	4.75	1.25	Tandon Corp.	3.00	0.13	4.35
NYS	27.75	11.63	Tektronix Inc.	27.75	1.13	4.23
OTC	0.53	0.16	Televideo Systems	0.31	0.06	25.20
NYS	60.13	29.00	Xerox Corp.	55.50	1.63	3.02
Leasing Companies			**Off 0.47%**			
OTC	16.25	7.00	Amplicon Inc.	14.75	-0.13	-0.84
NYS	28.38	14.63	Comdisco Inc.	23.63	-0.13	-0.53
OTC	15.00	8.88	LDI Corporation	12.38	-0.13	-1.00
OTC	5.50	2.25	Selecterm Inc.	4 50	0.00	0.00

Copyright Nordby International, Inc., Boulder, CO

THIS INFORMATION IS OBTAINED FROM SOURCES BELIEVED TO BE RELIABLE, BUT CANNOT BE GUARANTEED TO BE COMPLETELY ACCURATE. THIS INFORMATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

IBM, Apple begin detailing alliance

Vows include full Macintosh compatibility with new operating systems

BY PATRICIA KEEFE
and JIM NASH
CW STAFF

Officials from IBM and Apple Computer, Inc. sketched out some of the goals set for their new alliance and said they hope to nail down the details of the pact in the next 60 to 90 days.

In separate briefings last week, officials at the companies said the following:

- AIX users will enjoy some benefits from the Macintosh interface; OS/2 users will not.
- IBM envisions a three-tier Power PC chip family and will launch a related standards group to evangelize and provide information about the chips.
- Plans to deliver a jointly developed object-oriented operating system are four or five years off, but users of existing IBM and Apple desktop computers can expect to be migrated over time to the object-oriented environment through each successive upgrade of their current operating system (see story page 1).
- Apple officials have promised to make new products backwards-compatible. Apple also said that Apple and IBM will make sure all Macintosh applications — even those from third parties — will work with the new operating systems.

Officials from both firms remained mum about plans to create a separate, jointly owned venture that will create the object-oriented platform. However, late last week IBM said it plans to buy Metaphor Computer Systems, Inc. for an undisclosed sum. IBM had owned 20% of the firm, with which it had formed Patriot Partners, a venture to develop object-oriented software (see story at left).

IBM described the object-oriented framework under development by Patriot Partners as "complementary" and said it will be integrated into the new systems software company Apple and IBM plan to form.

RISC roster

On the hardware side, Phil Hester, director of IBM's Advanced Workstation and Advanced Engineering Center in Austin, Texas, said the company wants to extend the range of offerings in its RISC System/6000 line.

"We want a family of single-chip multiprocessors suitable for workstations and personal computers, to be OEMed by us, IBM and Apple," Hester said.

The three-tier family he envisions will target the following: notebooks and entry-level desktop machines; midrange desktops, including high-end PCs and entry-level workstations; and a high end consisting of PC servers and midrange workstations.

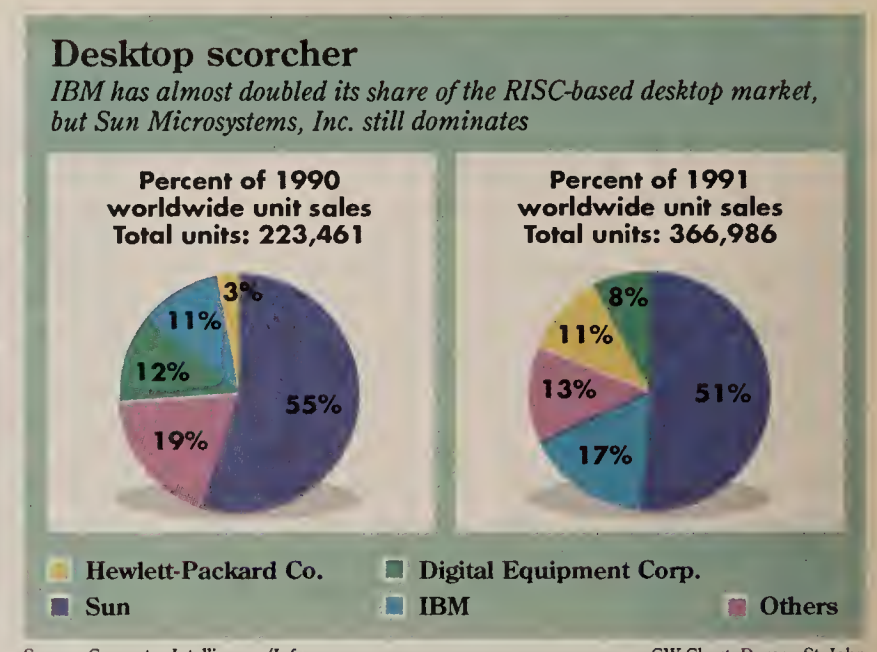
An IBM spokeswoman said IBM has not made any decisions about whether its Personal System/2 PC line will incorporate the Power PC chip. However, Joseph Guglielmi, IBM's general manager of marketing business development for the Personal System Business, said that IBM expects to drive both Intel Corp. and reduced instruction set computing (RISC) architectures, noting this will lead to some overlap. "We will have an application suite that will run on both the Intel and RISC [platforms]; we'll let the customer pick the base," he said.

Apple executives, meanwhile, made it clear that "more than anything," they want to link Macintoshes to IBM networks and create a Unix operating system common to both companies.

User perception in particular works against Apple in the connectivity areas, said Jim Groff, acting vice president of Apple's Enterprise Systems. Integration of the two companies' product lines is already under way, and users can expect even more Netview connectivity, Groff said.

Apple and IBM officials deviated in two areas. Apple said its forthcoming AIX box will look nothing like existing Macintosh hardware or software. IBM, however, said the enhanced AIX operating system will incorporate the Macintosh interface.

Also, where Apple said it will rely on third parties to develop compilers, IBM talked about developing a family of compilers, calling it a critical component.



Source: Computer Intelligence/Infocorp. CW Chart: Doreen St. John

Metaphor in the mix

MOUNTAIN VIEW, Calif. — IBM's decision to purchase Metaphor Computer Systems is the culmination of a long courtship. Metaphor developed a line of powerful but expensive user-friendly, database-oriented products before the proliferation of workstations. Its Data Interpretation Systems (DIS) were launched in 1984, two years after the firm was founded. IBM invested $15 million in Metaphor in 1988. In May 1989, IBM and Metaphor announced a joint development in DIS, with Metaphor software running on IBM platforms. In September 1990, the firms formed Patriot Partners to develop portable object-oriented software that applications could write to.

OS/2 plans

FROM PAGE 1

different motives who are trying to confuse this issue. OS/2 as a strategy is a fundamental direction, and we are committed to it." Guglielmi added that IBM's work on OS/2 with various partners is continuing.

Most OS/2 users shrugged off any threat to their long-term plans. Although an IBM spokesman did say that OS/2 would be replaced by the as-yet-unnamed object-oriented operating system to be co-developed with Apple, users contacted last week expect IBM to migrate them.

The alliance will not deviate the Royal Bank of Canada from its OS/2 strategy. Not now or four years from now, said George Oliver, manager of information delivery technology. "Long term, we are not worried about IBM abandoning investment in OS/2. The guarantee we'll have from IBM will be migration and coexistence."

However, Sheldon Laube, technology director at Price Waterhouse, said he was "deeply disturbed" and confused about what IBM's message is. "I'm very concerned about investing now in IBM if the future will be different" than the currently expressed OS/2 strategy, he said.

At this point, Robert Holmes, computer technical research analyst at Southern California Gas Co. in Los Angeles, said he does not see any short-term impact or long-term benefits for OS/2 users. But, he said, the alliance adds more confusion to an already confused market.

Possibly the biggest issues facing OS/2 users are whether they will get the Macintosh interface (IBM said they will not); whether AIX efforts will overshadow the OS/2 commitment (IBM said no); and how IBM plans to link existing applications with a completely different animal: the object-oriented operating system.

This should not be an area of concern, said Donna Van Fleet, who heads up IBM's Personal Systems Programming Center in Austin, Texas. IBM will embed object-oriented pieces into existing operating systems in order to begin the migration to an object-oriented environment.

"We have the intention to provide [software] adapters for AIX, OS/2 and the Macintosh [to let them] remain viable in the new environment," Van Fleet said, adding that details remain to be worked out. For example, Lee Reiswig, assistant general manager of programming for IBM Personal Systems, said that when OS/2 2.0 ships this year, it will contain "a number of" object-oriented features.

Still, some analysts agreed with executives at OS/2 development partner Microsoft Corp. that IBM is kissing off OS/2.

"IBM on its own is doing more to blunt the momentum of OS/2 than anything Microsoft has done," said David Bayer, an analyst at Montgomery Securities in San Francisco.

Three months ago, Bayer noted, "IBM went to customers and said, 'OS/2 is not dead. It is a strategic part of the future.' " Now it is telling users that in four years it will migrate them "to a [point that] may be incompatible with Presentation Manager."

Microsoft commitment ebbs with drift away from OS/2

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp.'s constantly devolving support for OS/2 could have a greater impact on IBM's renewed OS/2 push than anything that might come out of the recently announced IBM/Apple Computer, Inc. alliance.

In the past two weeks, Microsoft officials have once again revised their ever-shifting story on OS/2 and the New Technology kernel. Steve Ballmer, Microsoft's senior vice president of systems software, said in an interview that New Technology is now called Windows New Technology. He also said it will ship next year without full OS/2 support. That could come later, if at all, he said.

Instead, New Technology will ship as a mode supported under Windows 3.1, which is expected to ship this year, featuring support for only Windows and DOS. At that time, Microsoft will drop Windows real mode, he said.

New Technology is portable Windows, is not DOS-based "in any way" and features 32-bit support, he said. A developer's kit is slated to ship this year.

Ballmer characterized the OS/2 3.0 project as contract work for IBM, adding that it will share a lot of Windows and New Technology code. As such, he said, it might be possible to sell New Technology users an OS/2 3.0 upgrade module.

"I think this is a great approach to allow customers who made investments in OS/2 to converge them on a Windows base," he said.

Ballmer said that Microsoft had always positioned New Technology as a separate entity from portable OS/2 3.0. However, in January, Microsoft clearly stated that OS/2 3.0 would be built on the New Technology kernel, which was to support DOS, Windows 3.0, Windows-32, OS/2 Presentation Manager and Posix applications.

But that was then. Now, despite Ballmer's denials, developers and analysts agreed that the company routinely downgrades support for OS/2 and modifies corresponding descriptions of what it calls New Technology.

As a result, developers who purchased $3,000 OS/2 developer's kits from Microsoft are angry, according to one such developer and Jesse Berst, editor of the "Windowswatcher" newsletter. Berst recently went to a Microsoft developers' conference attended by about 300 developers. The handful that were developing for OS/2, he said, are very unhappy.

IBM/Apple deal could take heat off Microsoft

BY NELL MARGOLIS
CW STAFF

The alliance of IBM and Apple Computer, Inc. is not only likely to escape an antitrust challenge, it could also keep the regulators away from archrival Microsoft Corp.'s door, industry observers said last week.

"This deal doesn't look like it's going to strangle competition," said computer law specialist Alan Wernick, an attorney at Hahn, Loeser & Parks, a law firm based in Columbus, Ohio.

For instance, he said, the Power PC single-chip reduced instruction set computing (RISC) technology slated to fuel IBM/Apple's new generation of workstations should detonate an explosion of clones.

Similarly, he added, the IBM/Apple foray into Unix-based, object-oriented platform design should launch a fleet of software developers.

Tension reliever

Norman Weizer, a computer industry analyst at Cambridge, Mass.-based consulting firm Arthur D. Little, Inc., agreed. "This latest move probably eased the antitrust tension in the industry," he said.

The IBM/Apple pact, Weizer said, underscores the fact that no single company or cadre dominates the computer industry or manipulates pricing.

"What we see," he noted, "is a very competitive, price-driven market, where the alarming price drops that are increasing the competition are not being instigated by the market leaders."

In addition, Weizer said, "if there was any thought of an antitrust investigation of Microsoft brewing at [the U.S. Department of] Justice, there won't be now." The IBM/Apple combination, he said, will pack more than enough of a competitive wallop to dispel any view of Microsoft as an unfairly heavy hitter.

However, legal experts said nothing in the IBM/Apple scenario should affect the Federal Trade Commission's (FTC) ongoing investigations of Microsoft and chip master Intel Corp.

"The FTC challenge to Microsoft isn't being made on broad policy grounds," said a former Justice Department antitrust litigator who asked to remain anonymous. "This is a very targeted investigation; the FTC received so many [separate] complaints about specific Microsoft practices that it had no choice but to look into them."

Similar events, he said, fueled the probe of Intel. Neither investigation, he stressed, is an antitrust action.

The attorney also warned against confusing the recent wave of FTC interest in policing high-technology business practices with a resurgence of antitrust enforcement on the Justice Department's part.

RISC race yet to show winners

Shifting alliances ahead as vendors hedge bets on dominant architecture

BY J. A. SAVAGE
CW STAFF

With four separate alliances looking to dictate the next desktop standard, nonaligned systems and software vendors may have to gamble on which team is likely to spur the next-generation clone market.

The industry powerhouses are locked into their choices — they created them. IBM, Sun Microsystems, Inc. and Hewlett-Packard Co. are each pushing the reduced instruction set computing (RISC) architectures they developed. Digital Equipment Corp. literally bought into Mips Computer Systems, Inc. and its architecture, then went on to join forces with Compaq Computer Corp. to wrest the desktop out from under IBM's control with the Advanced Computing Environment (ACE) consortium.

On a second level are dozens of vendors, such as Wang Laboratories, Inc., that have signed up with one architecture or another as well as dozens of personal computer clone vendors that have signed with none.

The platform choice

The reasoning for a particular platform decision is several layers deep. They are betting that a particular architecture will garner enough sales to be attractive to independent software vendors so they, in turn, will port their products to a particular platform. This, however, is a circular bet as the number of units sold of a particular platform often depends on the amount of software available for it.

Until the situation firms up, the industry may be in for a time of shifting alliances as vendors hedge their bets.

In January, for instance, Wang signed up for Mips architecture. After beginning to sell some Mips-based systems, Wang decided last month it would resell IBM's architecture. A Wang spokesman would say only that the company is "evaluating" whether to completely drop the Mips line and its membership in the ACE consortium.

Consortia-hopping is easy. Third parties, such as LSI Logic Corp. in Milpitas, Calif., will make the engineering simple. LSI supplies build-your-own kits to vendors for Sun's Scalable Processor Architecture-based machines and Mips-based machines. Motorola, Inc., which has its own, smaller alliance around its 88000 RISC chip, is expected to produce a more efficient IBM RISC architecture chip for sale to third parties.

Delayed choices

For some, the choice will be easy, but it will not come for some time. "We've always followed that technology that has been the choice of market segment," said Arthur Lazere, chairman of mail-order PC manufacturer Northgate Computer Systems, Inc.

"If the Apple/IBM group is going to prevail, it has to be a major revolution in the market," Lazere said. "As for the ACE initiative — the last time I heard about something like that was the Gang of Nine with [Extended Industry Standard Architecture], which never revolutionized the free world."

The IBM/Apple Computer, Inc. alliance will increase the competition for software ports and the last to form an alliance. "HP right now has the strongest architecture, but this [IBM/Apple] agreement puts them a distant fourth in terms of software support," said Tom Kucharvy, an analyst at Summit Strategies, Inc. in Boston.

However, executives with the most to lose insist the potential software draw of Apple and IBM has not changed their plans or views of the world.

Independent software developers, said Scott McNealy, chief executive officer at Sun, "have been our clear focus for seven years and the whole focus of Sunsoft," the company's new software subsidiary. "We are belligerently consistent in our strategy."

Chuck Boesenberg, president of Mips, said that software vendors "will port to the highest unit volume," and he is betting that his company will become the Intel Corp. of the RISC industry.

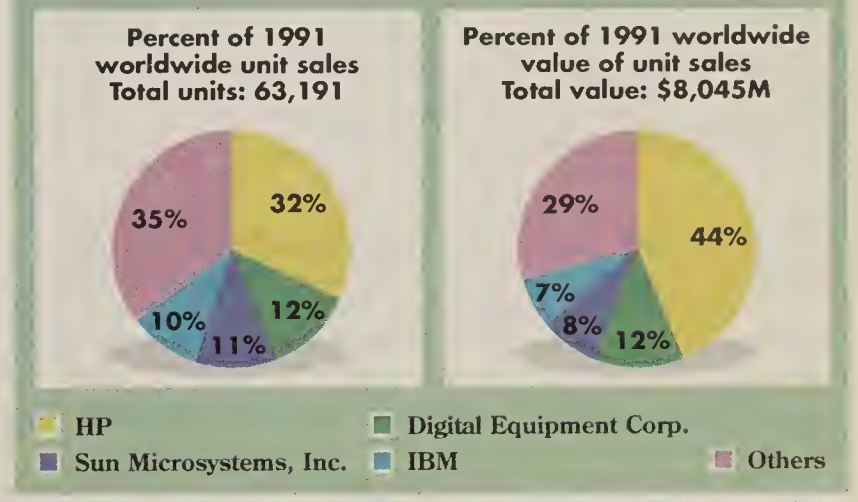
At Intel, David House, senior vice president of the architecture and applications group, said he sees the RISC competition as ugly, but only a paper threat. "The only reason vendors are using it is to remind Intel there is competition," he said.

Some industry players are not ready to count Intel out because of the IBM/Apple pairing. "I think it might lead to an Intel/Microsoft alliance, which might not be a bad one at that," Twinhead Corp. executive John Bryan said.

Staff members Michael Fitzgerald and Jim Nash contributed to this report.

One minicomputer company stands out

Hewlett-Packard Co.'s early commitment to RISC has built a commanding lead in multiuser RISC systems, but it now faces challenges from new alliances



Source: Computer Intelligence/Infocorp. CW Chart: Doreen St. John

PC sales

FROM PAGE 1

(IDC) in Framingham, Mass., and Dataquest, Inc. in San Jose, Calif., show a slight drop in 1991 desktop PC sales from last year's totals, with Dataquest predicting a continued decline in the years to come. This follows U.S. unit growth of 4.2% and 4.1% in 1989 and 1990.

Industry observers said the decline in desktop sales in the U.S. will see market leaders IBM and Compaq Computer Corp. lose market share and a number of small vendors disappear.

"Anytime you see a slowdown, you'll see third- and fourth-tier vendors continue to cut margins until survival is impossible," said Michael S. Swavely, former president of North American operations at Compaq.

Robert Charlton, an analyst at Dataquest, agreed that poorly managed smaller vendors would go out of business.

But Charlton and others said no leading vendors were likely to disappear.

"I don't see companies getting out, but changing tactics," said Charlton, who added that companies will begin to adopt different marketing strategies. "The companies that will be hit the hardest will be those which don't have a full product line."

An IBM spokesman said IBM expects to maintain overall market share in 1991. In 1990, IBM held 16.6% of the U.S. market, a similar level it had in 1989, according to IDC.

Smaller vendors generally disagreed with the reports.

Arthur Lazere, chairman of Northgate Computer Systems, Inc. in Eden Prairie, Minn., disagreed with the market research firms, saying they do not measure direct market sales. "You've got an outfit like Gateway who's just booming, we're selling a lot, Zeos is selling a lot . . . and then there's Dell."

Richard Zwetchkenbaum, senior analyst for PC hardware at IDC, said IDC includes direct marketers in its data.

The U.S. recession is certainly contributing to the falling off in sales, which may become broader as the recession threatens Europe.

PC downsizing

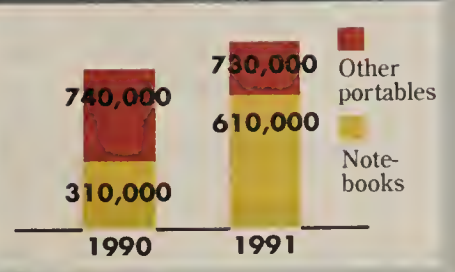
The U.S. PC market had been expected to slow in 1991 and now looks even worse

1991 U.S. PC market

(Percent growth)	Prior forecast	Revised forecast
Units	4.5%	1.6%
Value	6.6%	0.8%

Meanwhile, growth in the hot portables market is being driven by sales of notebook PCs

Portables market (units)



Source: International Data Corp. CW Chart: Janell Genovese

NEWS SHORTS

Computing bill advances

The U.S. House of Representatives approved a measure last week that would authorize $2.9 billion over five years for high-performance computing and communications. The program would help fund a gigabit/sec. National Research and Education Network (NREN) and fund advances in parallel-processing supercomputers. Meanwhile, rival Senators Albert Gore (D-Tenn.) and J. Bennett Johnston (D-La.) set aside differences over who would build the NREN and produced a compromise Senate bill, very similar to the House version, that leaves that decision to the White House. Gore said he hopes the Senate will vote on his bill by the end of July.

. . . . . .

Adobe sues rival on copyright

Another vendor has joined the copyright infringement throng as Adobe Systems, Inc. filed a lawsuit against U-Lead Systems, Inc. last week. The suit alleges that U-Lead's Photostyler program and manual infringe on the copyrights of Adobe's Photostop software and user manual.

. . . . . .

Microsoft fights back in patent suit

Microsoft Corp. said last week it petitioned the U.S. District Court to declare that the Redmond, Wash.-based company has not infringed on a patent owned by IQ Technologies, Inc. IQ approached Microsoft in September 1990 with concerns that the way in which Microsoft's serial mouse gets its operating power from the serial port of a host computer may infringe on IQ's Smart Cable patent. Microsoft said the claims are "unfounded" and wants the IQ patent declared invalid.

. . . . . .

Autodesk wins piracy suit

Autodesk, Inc., which makes Autocad, a widely used computer-aided design package, won a 2-year-old copyright infringement fight last week involving its Autocad package against Southern Technical College in Little Rock, Ark. Autodesk received a six-figure settlement from Southern Tech to cover statutory damages and attorney's fees. The decision also requires Southern Tech to remove all illegal copies of Autocad, submit to surprise audits at all of its campuses for the next three years and install a version of Autocad with a physical locking device.

. . . . . .

University inks supercomputer pact

The University of Minnesota has signed a purchase order for massively parallel supercomputer from Thinking Machines Corp. The supercomputer will be operated and maintained by the university for the U.S. Army High Performance Computing Research Center (AHPCRC), which is located at the Minnesota Supercomputer Center. The new system will provide university and Army researchers with the first model of the new supercomputer that is potentially the world's most powerful for continuum mechanics, nonlinear dynamics, computational chemistry and other areas, according to Donald Austin, executive director of the AHPCRC.

. . . . . .

South African export ban lifted

President Bush's decision to revoke trade sanctions against South Africa last week also lifts the ban on computer exports to the South African police, military and other apartheid-enforcing government entities. The president said the South African government had met the act's conditions for removing the sanctions. However, other U.S. export controls and various state and local statutes restricting business with South Africa still exist.

. . . . . .

Compaq sets up Japan operation

Compaq Computer Corp. plans to announce this week that it has established a subsidiary in Japan, a company spokesman confirmed. Masaru Murai, a longtime employee at IBM Japan, will be president of Compaq's Japanese branch. Presently, Compaq's sales in Japan are limited to large multinational companies that have standardized on Compaq equipment.

U.S. acts on Japan's dumping

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. ruled last week that Japanese firms are selling flat-panel computer displays in the U.S. at less than fair value. The finding by the U.S. Department of Commerce could pave the way for the imposition of stiff antidumping duties that would boost the price of advanced laptop and notebook personal computers sold in the U.S.

However, widespread price increases are not likely to happen soon because passive-matrix LCDs — the type of displays most commonly used today — will not fall under the ruling.

The U.S. International Trade Commission (ITC) now has 45 days to confirm that the dumping is harming U.S. industry, as indicated by its preliminary investigation.

If injury is confirmed, the offending companies will have to pay import penalties of 7.02% for electroluminescent displays — used in rugged military computers — and 62.67% for active-matrix LCDs, the advanced technology for high-resolution monochrome and color displays.

Passive-matrix LCDs were excluded because there are no U.S. manufacturers to be harmed by imports, according to the ruling.

Ultimately, some U.S. systems vendors said, penalties on screen imports could force them to manufacture next-generation models overseas because completed computers would not be subject to the duties.

Compaq happy

Compaq Computer Corp., which uses Japanese passive-matrix displays in its computers assembled in Houston, was pleased to learn it will not have to pay penalties on those displays. "But we are concerned about the active-matrix position," a Compaq spokesman said. "The consensus is that that's the emerging technology."

IBM and Toshiba Corp. set up a joint venture facility in Japan for making the active LCDs, and IBM's imports from that plant would now be subject to the huge new penalty.

"We're deeply disappointed by the decision," IBM spokesman Michael Dutton said. "It will tend to increase the cost of [portable] computers made in the U.S. because there's no U.S. source" for active-matrix LCDs.

Dutton said the display accounts for some 30% of a portable computer's cost, and the penalty on the color displays could increase prices by almost 19%.

Apple Computer, Inc. would be hard hit if the 62.67% penalty is upheld by the ITC injury determination. Apple sells portable computers using monochrome active-matrix LCDs supplied by Japan's Hosiden Electronics Co. But James Burger, senior trade lawyer at Apple, said the decision by the Commerce Department to separate the flat-panel industry into four segments by technology type now makes it easier to convince the ITC that no harm has been done to U.S. industry in the one segment that Apple cares about.

Seagate cuts work force to remain competitive

BY JEAN S. BOZMAN
CW STAFF

SCOTTS VALLEY, Calif. — Faced with pricing pressure, Seagate Technology, Inc. said on Friday that it would lay off 1,200 people — 18% of its U.S. and European work force.

The $2.4 billion company makes disk-drive devices with capacities ranging from 20M bytes to 2G bytes.

The layoffs, which mostly affect administrative personnel, will take effect immediately, according to the company. Employees will receive one week's pay plus one week's pay for every year they worked at the company.

"Seagate is still seeing very good demand for its products," said Julie Still, manager of corporate communications. "Our issue is a profit-margin issue. We are seeing intense pricing pressure, and our current revenue and profits do not support the level of staffing Seagate currently holds."

Seagate's worldwide work force, including manufacturing facilities in the Far East, totals 41,000 employees; no manufacturing jobs were affected by the layoffs.

Seagate, which was founded in 1979, has had a history of reducing its work force to stay profitable despite changing economic conditions.

"They have a reputation for swinging the ax when they have to and pumping the fire when they have to," said Bob Katzive, vice president of Mountain View, Calif.-based Disk/Trend, Inc., a market research firm. "They are not afraid to downsize the company to keep the firm financially stable."

The cuts, made June 30 after the close of Seagate's fiscal year, echoes two previous layoffs at the firm in the 1980s. The 1984 layoff came when Seagate decided to move its manufacturing facilities to Asian countries to keep overhead costs low, Still said. The 1988 layoff came even before Seagate acquired Imprimis, Inc., a former Control Data Corp. subsidiary, in 1989.

DEC plans to lay off 800 more workers

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. announced another round of layoffs last week with a cut of 800 employees from its U.S. sales and support organization. Another wave of pink slips is expected when the company announces fourth-quarter earnings on July 25, analysts said.

Customers should be spared any adverse impact from the layoffs because the sales organization remains larger than it was 18 months ago, said DEC spokeswoman Nikki Richardson. The company had beefed up sales and support by adding roughly 2,500 people in early 1990, so trimming 800 still leaves a bigger force in place.

During the past 1½ years, DEC had shed roughly 10,000 employees and dropped its worldwide employee count to 121,700 by March. Industry analysts expect another 20,000 to 25,000 DEC employees to be looking for new jobs during DEC's 1992 and 1993 fiscal years, and executives confirmed that future layoffs of 8,000 to 10,000 per year are likely.

"The medicine DEC is taking is the right kind, but one can always quarrel about the dosage. The lighter the dose, the longer it takes to recover," said David Wu, a financial analyst at S. G. Warburg & Co.

Analysts were predicting earnings of $1.04 to $1.25 per share this quarter before the charge against earnings. DEC shares were up by more than $2.87 last week, closing at $62.75 late last week on the New York Stock Exchange.

Oracle ascends to $1B mark after rocky fiscal '91

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Corp. has finally achieved the $1 billion revenue mark, but the celebration was bittersweet last week. The company closed out fiscal 1991 with a $12.4 million loss and a substantial revision to the numbers it posted in 1990.

Fourth-quarter revenue was $287 million, down 10% from one year ago, and profits were $6 million, compared with $42 million one year ago. Oracle also took a onetime $20 million charge to pay for the consolidation of leased and owned office space and to cover lost consulting and sales revenue.

"Obviously, this has been a very difficult year for the company, after many years of success," said Jeff Henley, Oracle's chief financial officer. "But I'm very comfortable with the quality of our balance sheet at this point."

Henley also said Oracle's work force of 7,500 had "dropped by about 100 people as we attempted to reduce through attrition and to get a handle on our costs." The job loss was not termed a layoff, however.

Financial analysts said the best news was that Oracle's cash flow had turned positive by $24 million in the third quarter, which ended Feb. 28. It continued positive by $67 million in the fourth quarter, which ended May 31.

By contrast, Oracle was "burning" cash last fall through excess overhead and slowing growth, analysts said. Much of the positive cash flow stemmed from collections of overdue payments from customers. Late last year, the firm began to go after more than $300 million in customers' unpaid bills; a thorough audit revealed that $42 million of those bills were uncollectible.

Oracle "did a pretty good job of improving their cash flow and their balance sheet. And they made money in the last two quarters," said Charles Phillips, a senior analyst at the Soundview Financial Group, Inc. in Stamford, Conn. The company's expenses, which rocketed as Oracle doubled in size during several years in the late 1980s, had moderated to just 3% growth in the fourth quarter, compared with one year ago, he pointed out.

Oracle users were philosophical about the company's troubles. "We're into this company for the long haul," said Carmine Tedesco, a project leader for database applications at U.S. Surgical Corp. in Norwalk, Conn. "We chose Oracle as a vendor because they're so big and because we were prepared to invest a lot of money in our database products."

Oracle's financial troubles have been going on for more than one year, highlighted by several recent violations of its loan covenants with an international syndicate of 13 banks on a credit line of up to $250 million extended last summer. In recent months, Oracle has reduced that debt to $150 million.

"The financing of this company has been fairly convoluted and complex," said Bruce Lupatkin, managing director of technology research at investment firm Hambrecht & Quist, Inc.

To regain its financial foothold, Oracle announced in June that it had reached an agreement for $200 million in new financing from Nippon Steel Corp. In return, the Japanese industrial firm will obtain a 49% stake in Oracle's Japanese subsidiary and the option to own a 9.8% share of Oracle stock by 1995.

After the fact

Accounting changes and reserves for uncollectible accounts slightly increased 1991 losses and whacked $37 million off of Oracle's bottom line for 1990

(in millions)	Before restatement	After restatement
1990		
Revenue	$970.8	$916.4
Profits	$117.4	$80.9
1991		
Revenue	$1,029.1	$1,027.9
Profits	-$11.7	-$12.4

Source: Oracle Corp. CW Chart: Janell Genovese

New Jersey

FROM PAGE 1

and could be interpreted as requiring licensing for all software developers. The bill targets people who design, specify, implement, test, validate, operate, maintain and manage software.

"If I own a business and go to a software designer, how do I know that he knows what he says he knows?" Kalik said. "It's an infant industry, as least as it affects the public, and there are certain minimum standards that anyone hanging out a shingle as a software designer should adhere to."

"I think there's a gap between her intentions and the bill's language," said Thomas J. Smith, a spokesman for Computer Sciences Corp. in Moorestown, N.J. "As the bill stands now, anybody who has programmers working for them could be impacted."

Smith estimated that at least 800 of Computer Sciences' 2,500 employees in New Jersey would be covered by the bill. "It would impact our ability to hire because no one could do software design unless they're licensed. It would limit the pool of potential employees," he said.

Although the bill passed the assembly with little fanfare, forces including Computer Sciences are being mobilized to defeat it in the Senate. "I give this bill a snowball's chance in hell of becoming law," said Ronald Palenski, general counsel for Adapso, a software industry association. "I predict a very, very tough fight."

> "I THINK THERE'S a gap between [Kalik's] intentions and the bill's language."
>
> THOMAS J. SMITH
> COMPUTER SCIENCES

An AT&T spokeswoman said that at least 5,000 of its employees would likely be affected by the bill, at a minimum estimated cost of $200 to $300 per employee.

The bill would require license applicants to meet educational criteria or work experience requirements and to pass a test to be developed by the board, whose nine members would be appointed by New Jersey Governor James Florio.

Some computer industry watchers suggested that the bill is not necessary because existing consumer protection laws, and a good contract between a consumer and his consultant could fill the need. But Kalik said that contracts do not always protect laypeople because "the wording of the contract is so involved that you'd need a computer scientist to write the contract."

Most users who were contacted had not heard about the legislation and were cautious about possible ramifications. "It could be a major problem for us," said James Smith, vice president of information services at Wakefern Food Corp. in Elizabeth, N.J. "We have about 200 people that could be affected" if the legislation were interpreted to apply to internal information systems departments.

The technical services manager in a major pharmaceuticals firm said, "My initial reaction is that it's just ludicrous. It's another bureaucratic infringement. We need more information."

Independent consultants are also upset. "I'm concerned that this will constrain my ability to do business," said Nick Cvetkovic, president of NBC Associates, Inc., a consulting firm in Cherry Hill, N.J.

Efforts at licensing, such as the Certificate of Data Processing promoted by the Data Processing Management Association, never took off because, among other factors, the measures were voluntary, according to observers.

After break, Heschel back in IS role as VP at Kroger

BY CLINTON WILDER
CW STAFF

CINCINNATI — After a career hiatus that lasted as long as his previous job, Michael S. Heschel returned to the information systems executive ranks this month in the top IS spot at The Kroger Co., the nation's second largest grocery store chain.

Heschel *accepts VP of MIS slot at grocery chain*

Heschel was named group vice president of MIS at Kroger on July 1, replacing veteran Jack G. Hudson. Hudson announced his intention to retire in May after 32 years with Kroger, the fourth largest publicly held retailer in the U.S. with 1990 revenue of $20.2 billion. Heschel is also responsible for building management, office services and Kroger's fleet of private aircraft.

Heschel's successful IS career took an unexpected turn last November when he resigned as head of Security Pacific Automation Corp. just seven months after leaving his powerful IS chief's post at Baxter International, Inc. [CW, Dec. 3, 1990]. According to industry sources, Heschel clashed with former Security Pacific Chairman John Singleton, another highly regarded IS executive who hired him after being promoted to run the giant bank's operations.

Heschel's abrupt departure from Security Pacific stunned the IS executive community as much as it apparently shocked Heschel. "I don't like to talk about that experience because it doesn't do anyone any good," he said. "But it did mature me to a point where I understand myself better."

Heschel is a member of Kroger's management committee, as was Hudson, and he reports to Executive Vice President William J. Sinkula.

Los Angeles-based IS consultant M. Victor Janulaitis, who has done work for and has known Heschel for many years, said Heschel should be able to apply principles from the health care products distribution industry to the supermarket business.

"He's a logistics guy who is at his best dealing with logistics systems and communications," said Janulaitis, president of Positive Support Review, Inc.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1991 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed.
Back issues, if available, may be purchased through Margaret McIndoe, at $2.00 per issue, plus postage.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.
Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.

MPA ABC ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

TRENDS

VAX software 1991

VAX sites add to existing software arsenals with tried-and-true data center software and less traditional client/server DBMSs

Software penetration

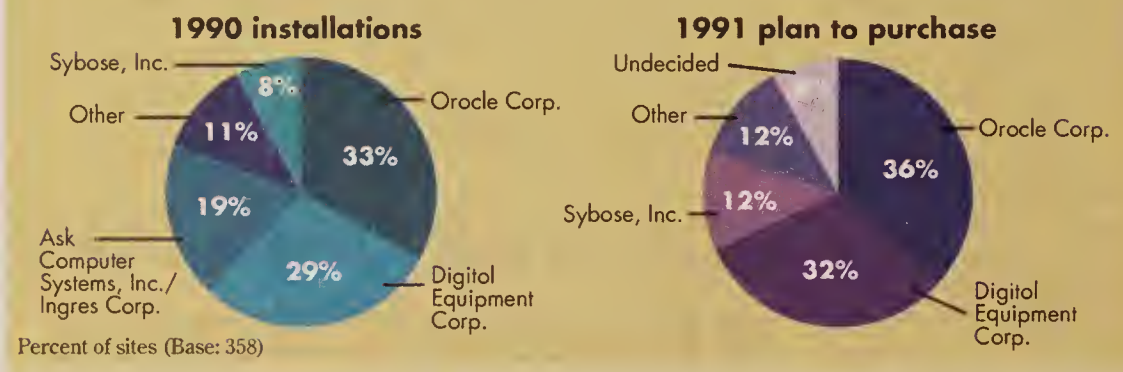
Client/server DBMS installations will almost double in 1991

	Penetration 1990	Plan to purchase 1991
Host-based DBMSs	39%	10%
Client/server DBMSs	16%	13%
Dictionary/Repository	22%	9%
Fourth-generation languages	29%	12%
Network management	39%	14%
Data center software	42%	20%

Percent of VAX sites (Base : 358)
Some systems run more than one application

VAX client/server DBMSs

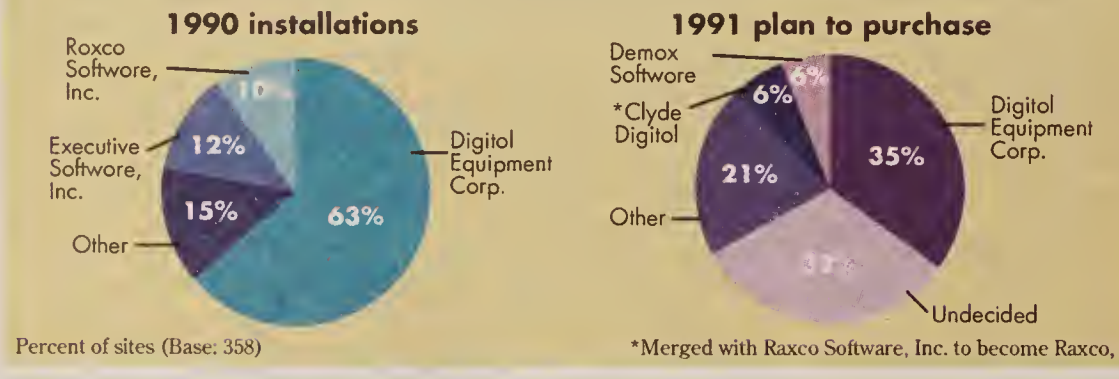
Despite a high level of user commitment to RDB/VMS, client/server DBMSs will fare well



Percent of sites (Base: 358)

Data center software

DEC's presence in the systems management support market will not be as dominant in 1991



Percent of sites (Base: 358)

*Merged with Raxco Software, Inc. to become Raxco, Inc.

Source: Sentry Market Research, Westboro, Mass.

CW Chart: Janell Genovese

INSIDE LINES

Freedom carries a price

▶ The Free Software Foundation (FSF), founded on the philosophy of free software and unrestricted access to computers, has pulled some of its computers off the Internet after malicious hackers repeatedly deleted the group's files. The FSF also closed the open accounts on the system to shut out the hackers who were using the system to ricochet into computers all over the Internet following several complaints from other Internet users. Richard Stallman, FSF director and noted old-time hacker, refused to go along with his employees — although he did not overturn the decision — and without password access has been relegated to using a stand-alone machine without telecom links to the outside world.

Data to go

▶ Sources near NCR say the company is close to penning deals with database vendors Informix and Oracle to go along with the agreement they already have with Sybase. The database agreements are expected to help NCR launch its higher level System 3000 series parallel processing machines with tailored applications software.

Heads clash, Metaphor-ically speaking

▶ IBM's pending purchase of Metaphor is seen by analysts as IBM's way of winnowing down several of its object-oriented projects. It could also pave the way for David Liddle, who heads up both Metaphor and Patriot Partners, to take on the new venture as well. However, a source close to Apple says Apple wants Ed Briss, who leads its object-oriented project, to head the new company.

Catch-22?

▶ A user who is very big on Lotus' Notes is waiting to see whether IBM's sales force, once it gets up to speed on Notes, can teach Lotus how to position and sell Notes as well as differentiate it from CC:Mail. Of course, this presumes Lotus can educate the IBM sales force on what Notes actually is.

A real muddle; but then, who cares?

▶ One interesting sidelight of the AT&T/NCR acquisition that has some users worried is this: Whose system will AT&T move its Accumaster Integrator network management platform onto next? Accumasters now running on AT&T 3Bs may soon become back numbers. Later versions that run on Sun workstations are also endangered species, given AT&T's announced plans to divest itself of Sun shares. Users may not be enthusiastic about a change to an NCR Tower. But on a positive note, there aren't supposed to be that many Accumaster users out there.

Is there some synergy here?

▶ The third-generation intelligent wiring hub that 3Com has said it will develop and manufacture all by itself is rumored to actually be a crossbreeding of 3Com and Fiber Distributed Data Interface (FDDI) vendor Synernetics technology. One analyst suspects 3Com's new hub will include Synernetics' Lanplexor technology, which dedicates Ethernet's 10M bit/sec. of bandwidth to individual workstations star-wired in a hub configuration and multiplexes them over an FDDI "backbone" in the hub.

Something is shining through

▶ Sun's Scalable Processor Architecture (Sparc) looks like it might attract the second coming of the clone makers. Sources close to Northgate, the mail-order PC maker, say the company will introduce a Sparc clone in the third quarter of this year, and sources near small OEM Twinhead say the firm has completed its own Sparc chip set and will begin shipping around the same time as Northgate.

Co-workers must have been scratching their heads looking for "Tom Peletier," the General Motors information security specialist quoted here July 1. Rest easy: Turns out the gentleman in question is actually their Tom Peltier. *And if anyone else sees something awry, contact News Editor Pete Bartolik at (800) 343-6474, fax the facts to (508) 875-8931, or drop a dime to our Compuserve line, 76537,2413.*

NEXT WEEK

Though **International Paper Co.** is staying true to mainframes and centralized IS, managing 25 acquisitions is far from a no-brainer for Karl Moore, vice president and director of IS, and his staff. There is still the matter of merging data centers, operating systems, databases, applications and corporate cultures. See Manager's Journal.

David Smart

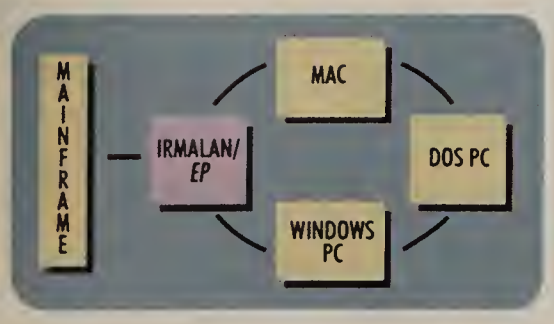
So, you want an executive information system, but you don't have hundreds of thousands of dollars to spend? Many IS managers are considering a LAN-based EIS, which promises to lower costs and speed response time. But there are other issues to contend with on the smaller platform. Read about the benefits and drawbacks in Product Spotlight.

Why have two gateways when you can accomplish everything you want with just one?

INTRODUCING IRMALAN FOR EXTENDED PLATFORMS

As the mainframe connectivity expert, DCA® has now pioneered new ground with the introduction of our enhanced 3270 gateway, IRMALAN™ for Extended Platforms (*EP*).

With our proven expertise in both PC (IRMALAN) and Macintosh® (MacIRMALAN™) gateway support, in addition to Windows™ 3270 connectivity (IRMA™ WorkStation for Windows), we've developed IRMALAN/*EP* as the single superior gateway solution.



With IRMALAN/EP 3270 gateway, you can support DOS, Mac and Windows clients with a single gateway.

With this single gateway, you can now support DOS, Mac and Windows clients. And it's also designed for IBM® NETBIOS, Novell®'s IPX/SPX protocol* and AppleTalk®.

And by supporting multiple platforms on your LAN, IRMALAN/*EP* eliminates the need to purchase more than one gateway. That's a cost savings that puts it far above anything offered by the competition.

But that's not all. IRMALAN/*EP* comes with RamXpander,™ our memory manager that allows fully featured emulation in less than 40K of resident memory.

Plus, our unique server licensing also makes it one of the most cost-effective gateways available. That's because we base the price on how many users on the LAN need to access the mainframe at once. So you only pay for the access you need, choosing from 8, 32, 64, or 128 concurrent users.

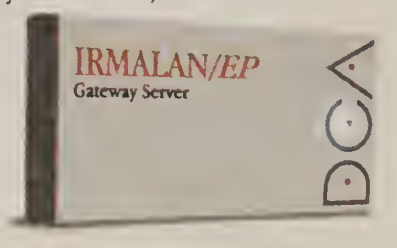
We've even made it easy to purchase IRMALAN/*EP* by including DFT, SDLC and 802.2 token-ring gateway software under NETBIOS, NetWare® and AppleTalk all in one package. So now, migrating to different gateway technologies won't cost a thing.

To get you up and running, the DOS client is also included. To extend your platforms, just add software for Macintosh and Windows users depending on your needs.

So now that there's only one gateway decision, just call DCA at 1-800-348-DCA-1, ext. 70E, to receive free information with further details on connecting your mixed LAN environments to the mainframe.

Or better yet, just call your reseller to order IRMALAN/*EP* today. Because with our new single gateway solution, now there's no need for you to even think twice.

DCA



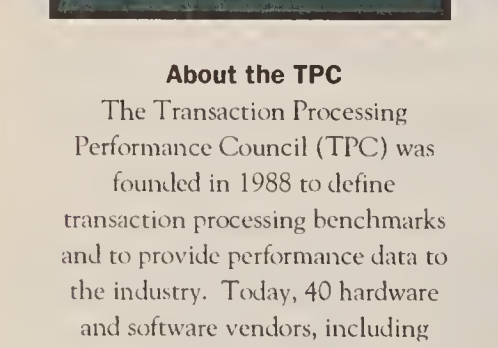
*Windows client software is not yet available for the Novell IPX/SPX protocol. ©1991 Digital Communications Associates, Inc. All rights reserved. DCA is a registered trademark and IRMALAN, MacIRMALAN, IRMA, and RamXpander are trademarks of Digital Communications Associates, Inc. All other brand and product names are trademarks or registered trademarks of their respective owner

UNIX DATABASE

Which UNIX® RDBMS did Hewlett-Packard®, IBM®, Unisys®, Data General®, AT&T®, Sun®, and Sequent® choose to demonstrate the power of their latest UNIX Systems?

Informix.

IDC Study on UNIX OLTP
UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC
The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, *every one* of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

New TPC Benchmarks Used

In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

The Number 1 Choice for UNIX OLTP

Informix is the number one UNIX OLTP choice. A January 1991 International Data Corporation (IDC) study shows that when it comes to UNIX OLTP applications, Informix products are installed at *more than twice as many multi-user UNIX sites* as our closest competitor. It's independent confirmation that thousands of companies worldwide rely on Informix-based OLTP solutions every day.

A Decade of Innovation

Informix has been a UNIX RDBMS technology leader for over 10 years. Continuous innovation has resulted in advanced application development languages, distributed client/server computing, gateways to other computing environments, and multimedia flexibility you can take advantage of today.

Find Out More

We'd like to send you benchmark specifics—and information about how Informix products can meet your data management needs.
Call us toll free: **1-800-688-IFMX, ext.2.**

INFORMIX-OnLine Database Server
OnLine was built for speed...and that's what it delivers. Developed entirely on UNIX, the OnLine server turns in optimum performance on every popular UNIX architecture—including symmetric multiprocessors, RISC, and CISC.

TP1 vs. TPC Benchmarks
The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similiar to a batch test—focuses on database throughput.

INFORMIX®
Data management for open systems.

© Copyright 1991, Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc. All other names indicated by ® or ™ are registered trademarks or trademarks of their respective manufacturer.